

RICE UNIVERSITY

**SURFcity:  
a new model for the peripheral urban environment**

by

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A THESIS SUBMITTED  
IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE DEGREE


**Master of Architecture**

APPROVED, THESIS COMMITTEE:



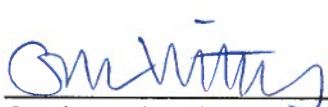
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HOUSTON, TEXAS  
MAY 2013

# abstract

SURFcity reorganizes, redistributes, and recentralizes the peripheral urban environment of diffuse and urbanized architectures into condensed architectural form. Through surface elaboration and densification techniques, it produces a new model for a contemporary city and community. Bringing together differences otherwise experienced at a regional scale to the human scale, it produces hybrid programs, new interior public space, and allows the surrounding exterior area to return to nature.

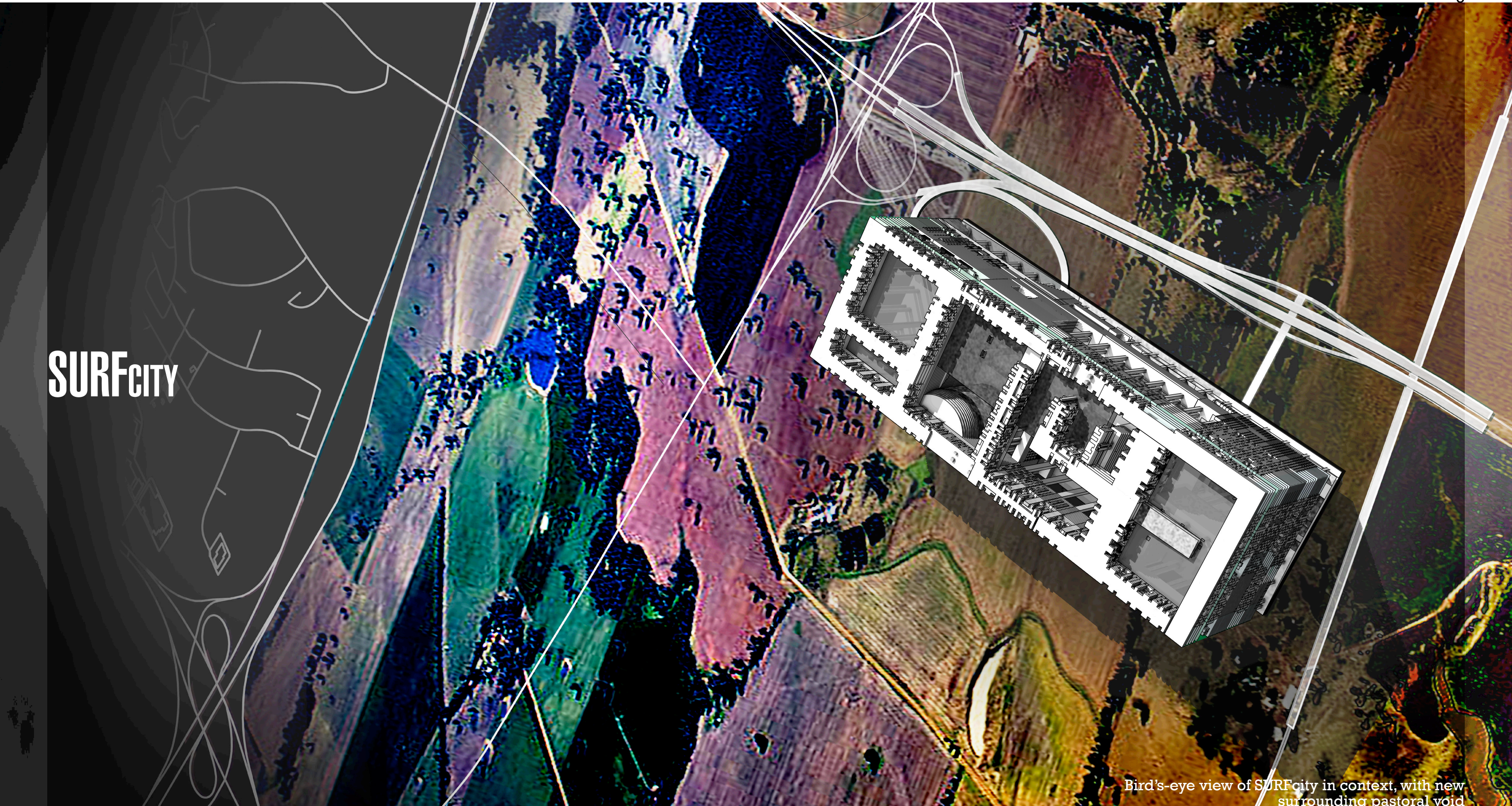


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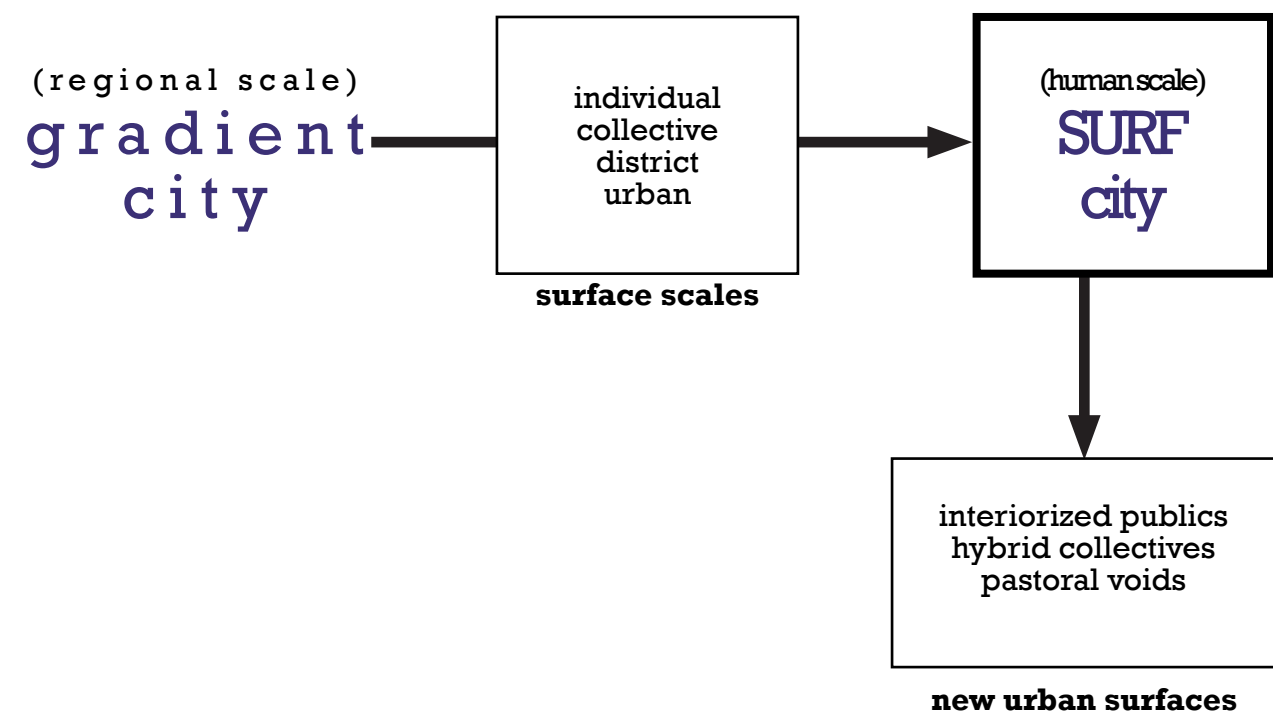


# SURFcITY



Bird's-eye view of SURFcITY in context, with new surrounding pastoral void





through the lens of  
new types of surface  
scales, SURFcity reigns  
in the unwieldy diffuse  
development of the  
existing gradient city

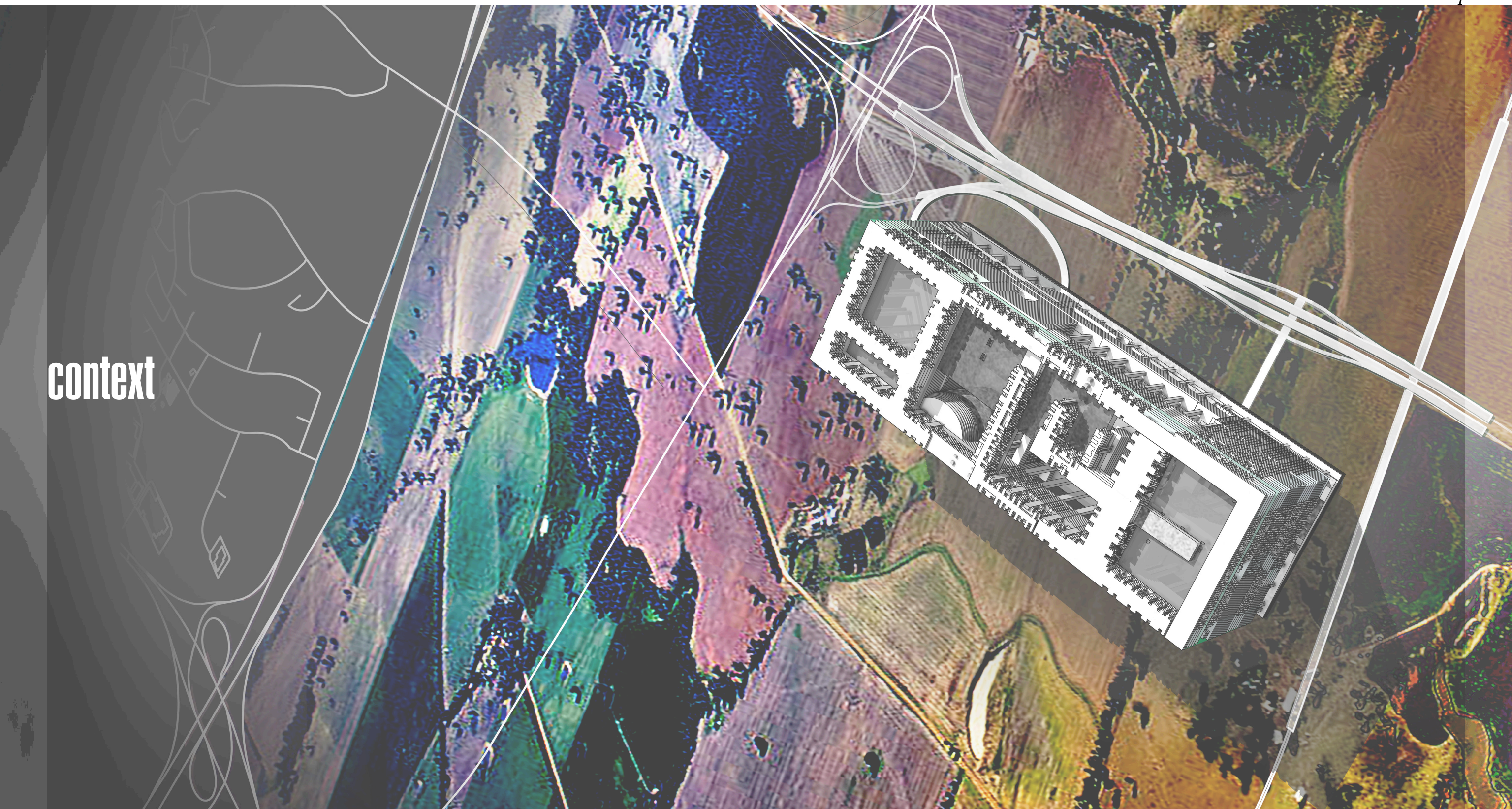
SURFcity reorganizes, redistributes, and recentralizes the peripheral urban environment of diffuse and urbanized architectures into condensed architectural form. Through surface elaboration and densification techniques, it produces a new model for a contemporary city and community.

Bringing together differences otherwise experienced at a regional scale to the human scale, it produces:

- (1) hybrid programs
- (2) interior public space
- (3) exterior pastoral void: surrounding exterior area returning to nature.



context





The site is 2 miles west of the Baltimore-Washington International Airport. This area between Baltimore and Washington DC typifies the diffuse and centrifugal development of the peripheral urban environment. Blurring urban qualities and intensities into a sea of evenness and homogeneity, it produces surface redundancy through atomized and monoprogrammatic development in the *horizontal* dimension.





# Sponge Urbanism

sequence of SURFcity's  
*REurbanization:*

1

2

3

4

Leveraging the robust infrastructures demanded by this diffuse, regionally-scaled, perceptual environment, SURFcity is like a box-store of encapsulated urbanism on the highway (between the BWI parkway and I-95 corridor); 17 times denser than its surrounding context.

The 1000'x1000'x3000' block absorbs generic contextual surface types and differences (industrial, office, residential, commercial) into a finite architectural container, leveraging the under exploited surfaces of one type against the useful surfaces of another.

The roof of the old light industrial factory in the landscape becomes the plinth, floor, or ceiling of the office complex that used to sit isolated in a sea of asphalt. The office complex's vertical surfaces frame new public interiorities, charged by the hybrid programming of multiple surface-types.





SURFcity counters gradient-development. It switches the model of the peripheral city, and its development, from centrifugal to centripetal, from outward to inward, and builds a new collective experience out of this density juxtaposition. As this new city is condensed into SURFcity's block, the existing peripheral landscape is evacuated and allowed to turn back into to a natural void.



An aerial photograph of a landscape featuring a highway and a large, white, box-like architectural structure. The structure has a complex, multi-level design with a central courtyard and a large, curved, white, cylindrical element. The surrounding landscape is a mix of green fields, brown fields, and a river. The highway is a multi-lane road that runs diagonally across the image. The architectural structure is a large, white, box-like building with a complex, multi-level design. It has a central courtyard and a large, curved, white, cylindrical element. The building is surrounded by a mix of green fields, brown fields, and a river. The highway is a multi-lane road that runs diagonally across the image. The overall scene is a mix of natural and built environments.

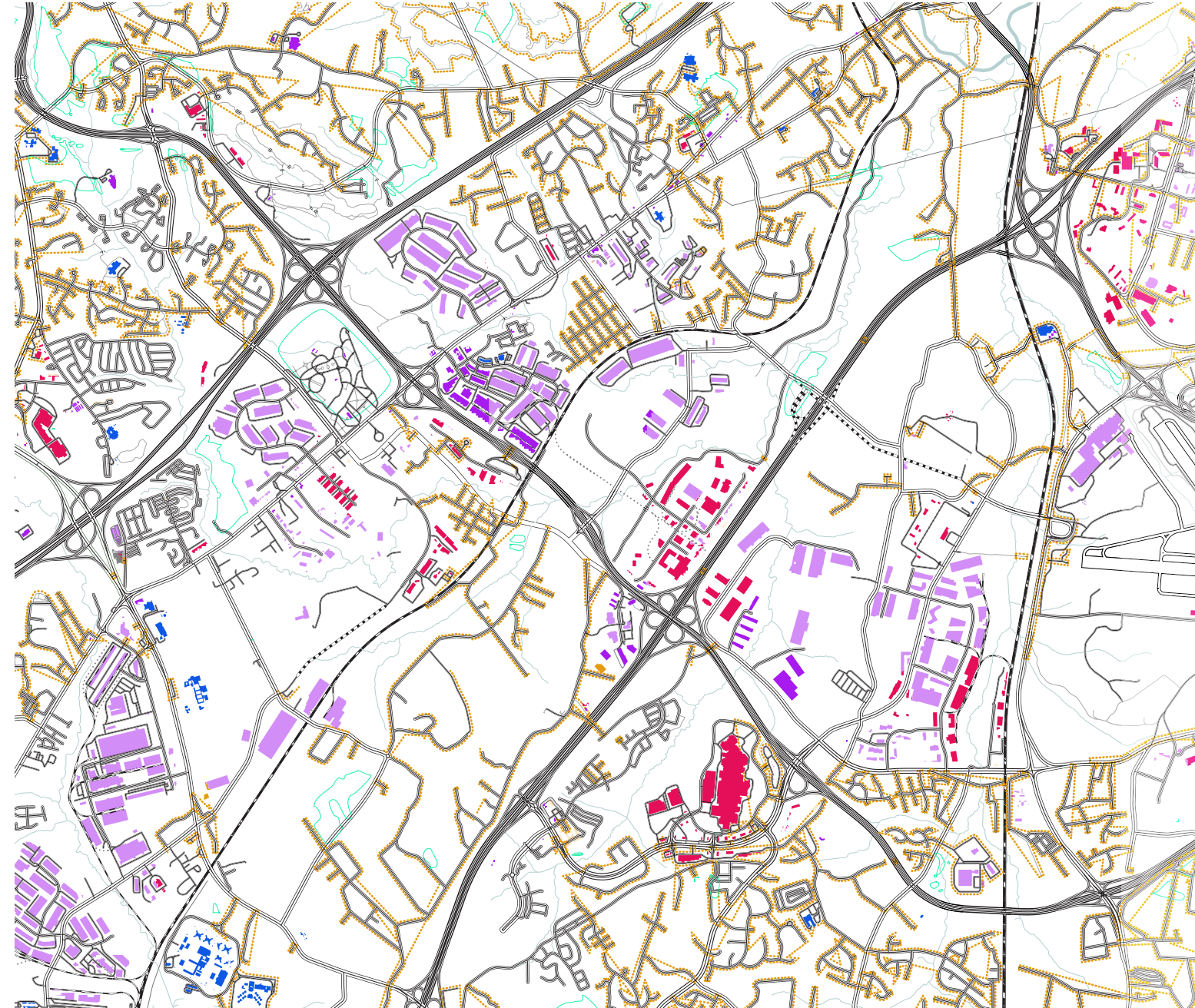
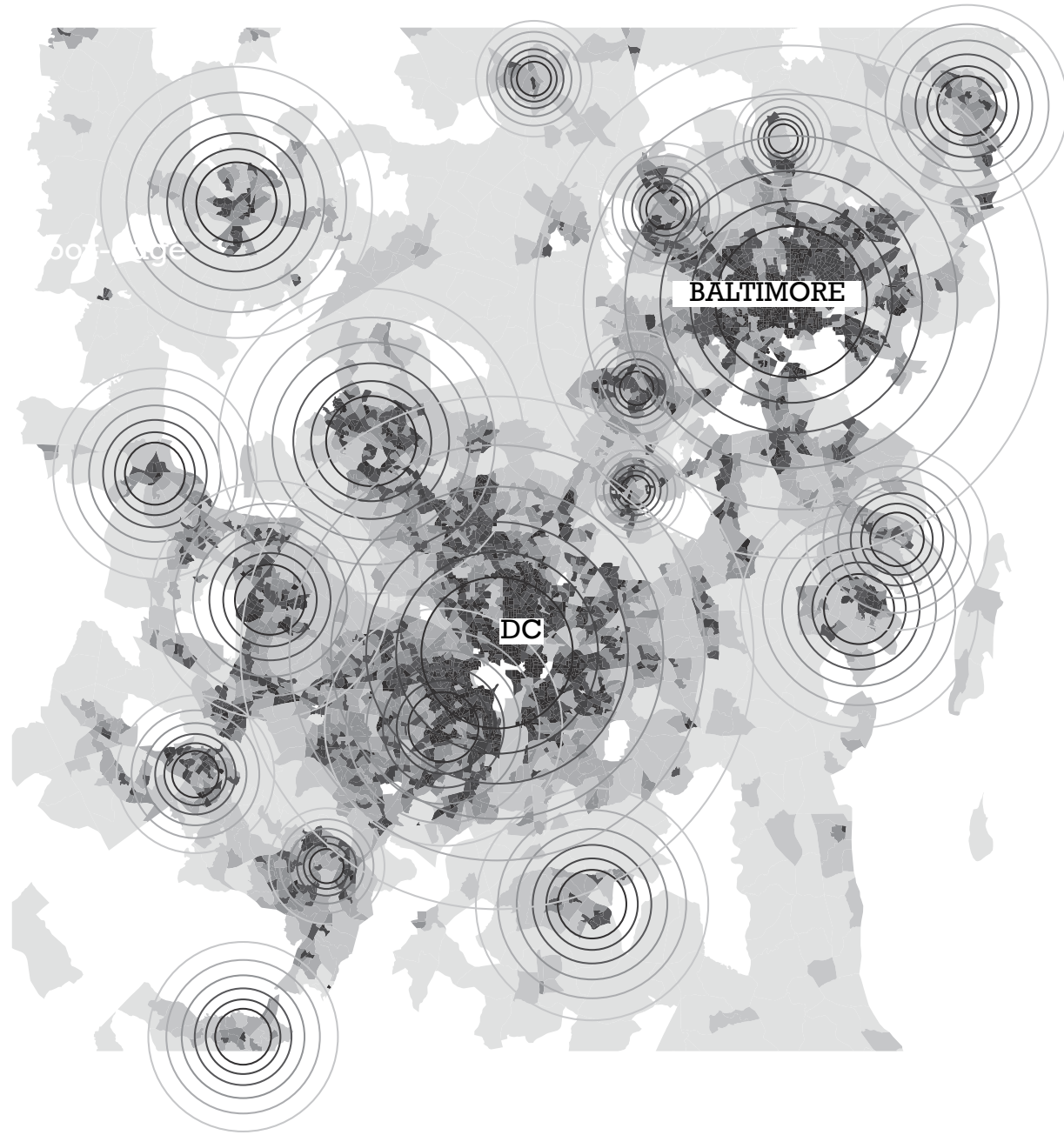
# urbanism sequence

A box-store of encapsulated urbanism on the highway, SURFcity absorbs generic contextual surface types and differences into a finite architectural container.

The redevelopment of the peripheral urban environment is sequenced over time. As the redensification intensifies, so too does the evacuated land previously occupied by low, diffuse, horizontal development. This recuperated space is given back to nature.

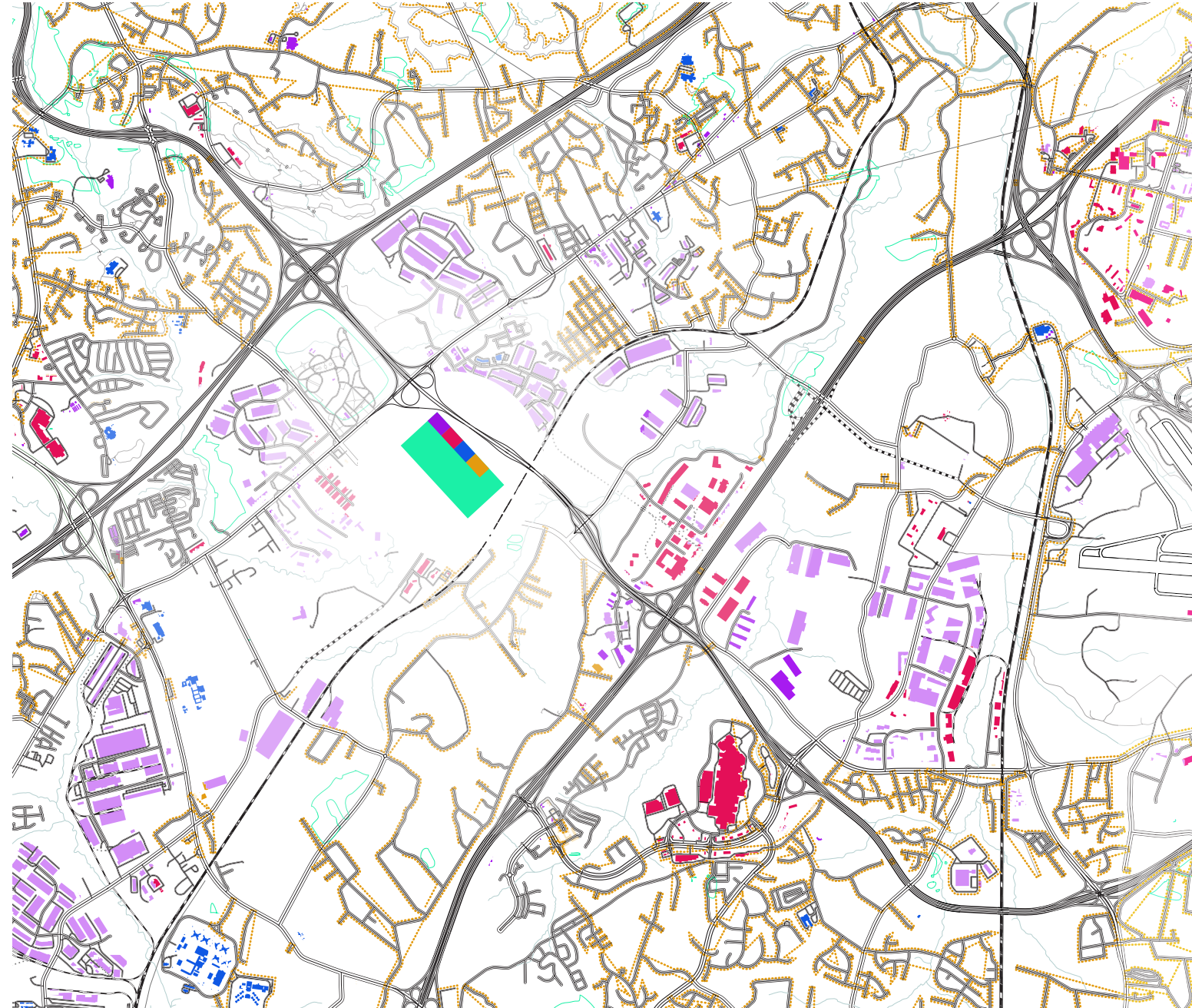
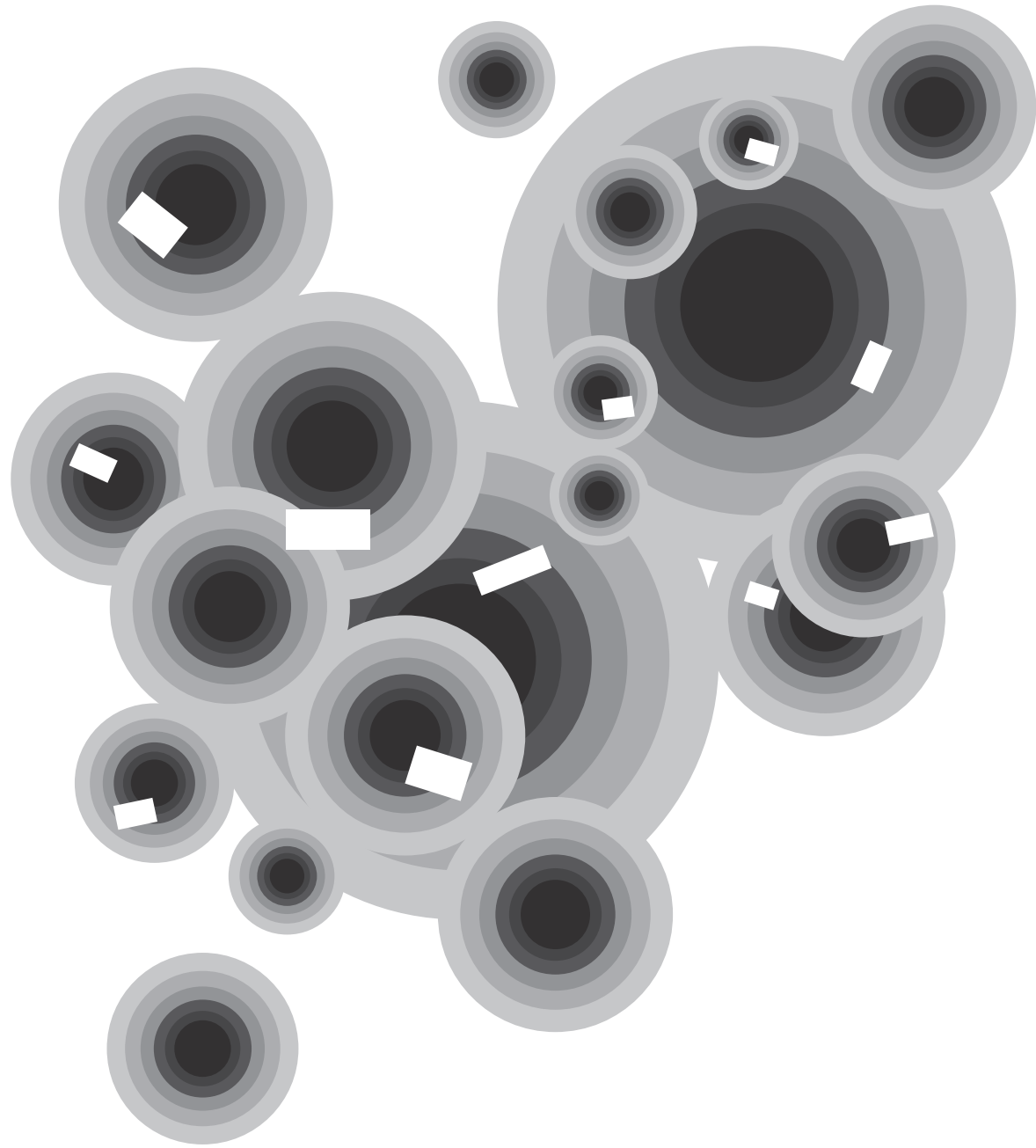


the existing peripheral urban environment is one of even and homogenous surfaces; producing redundancy and non-human scales of perception



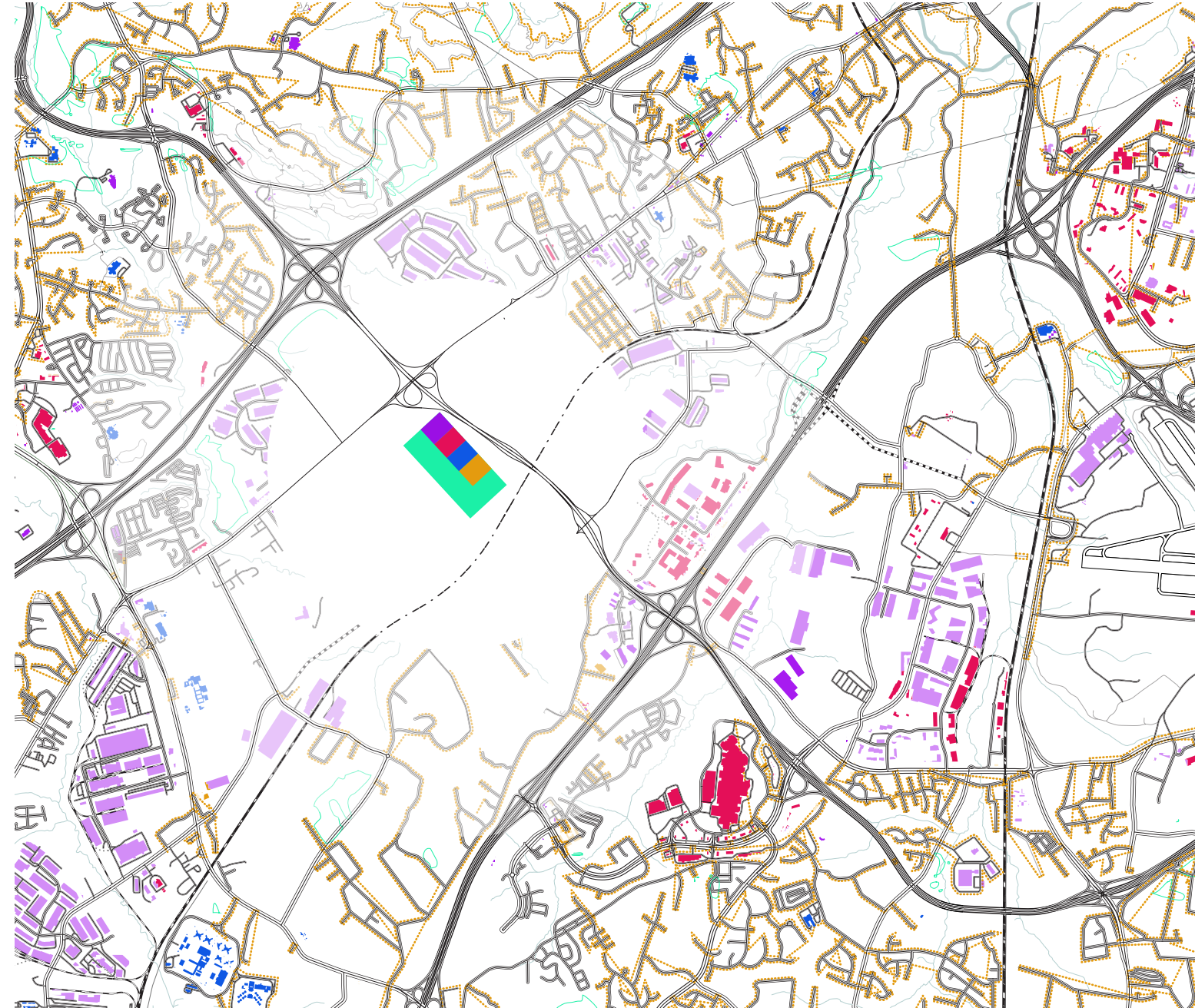
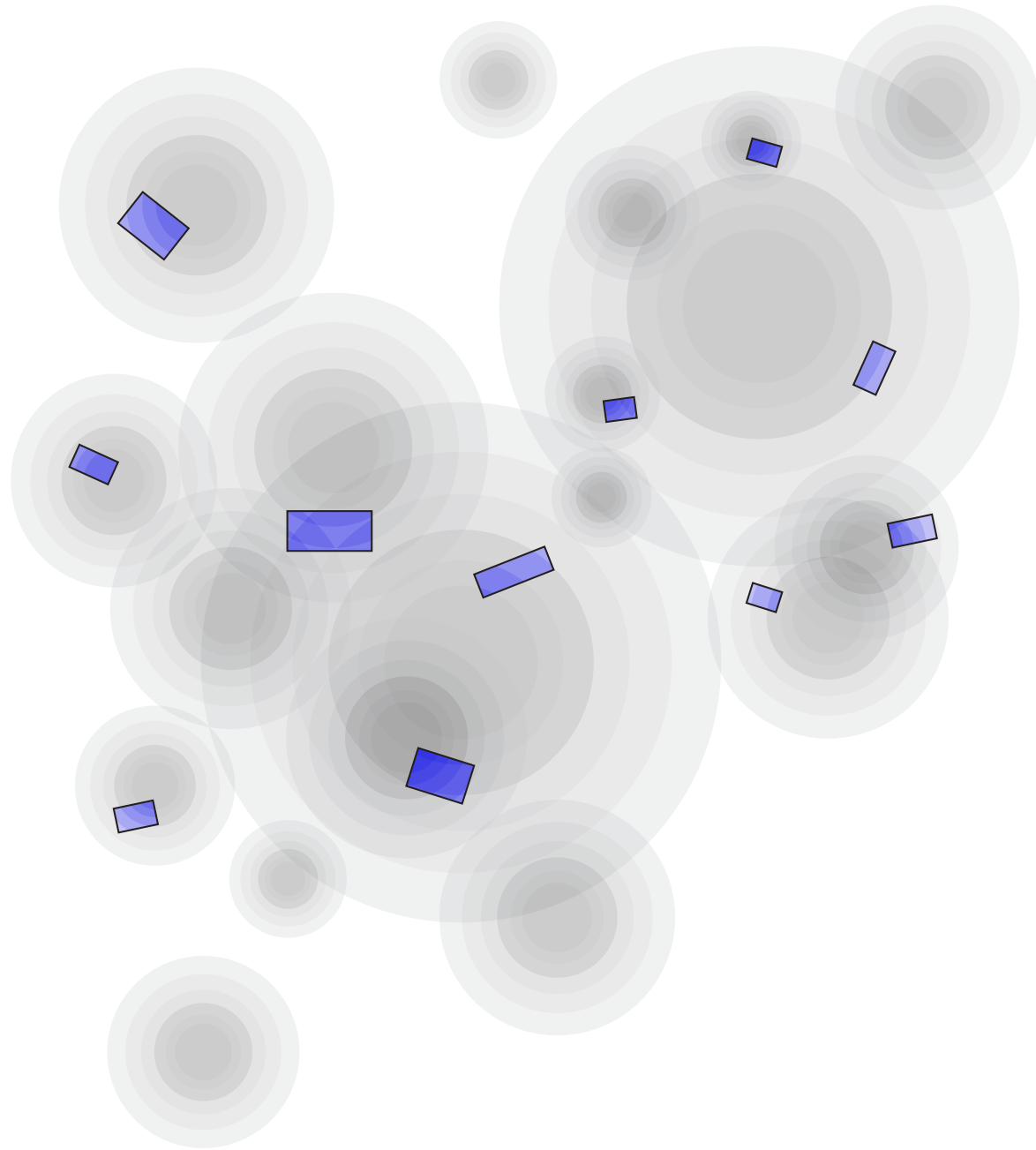


SURFcity proposes a box store of dense urbanism on the highway





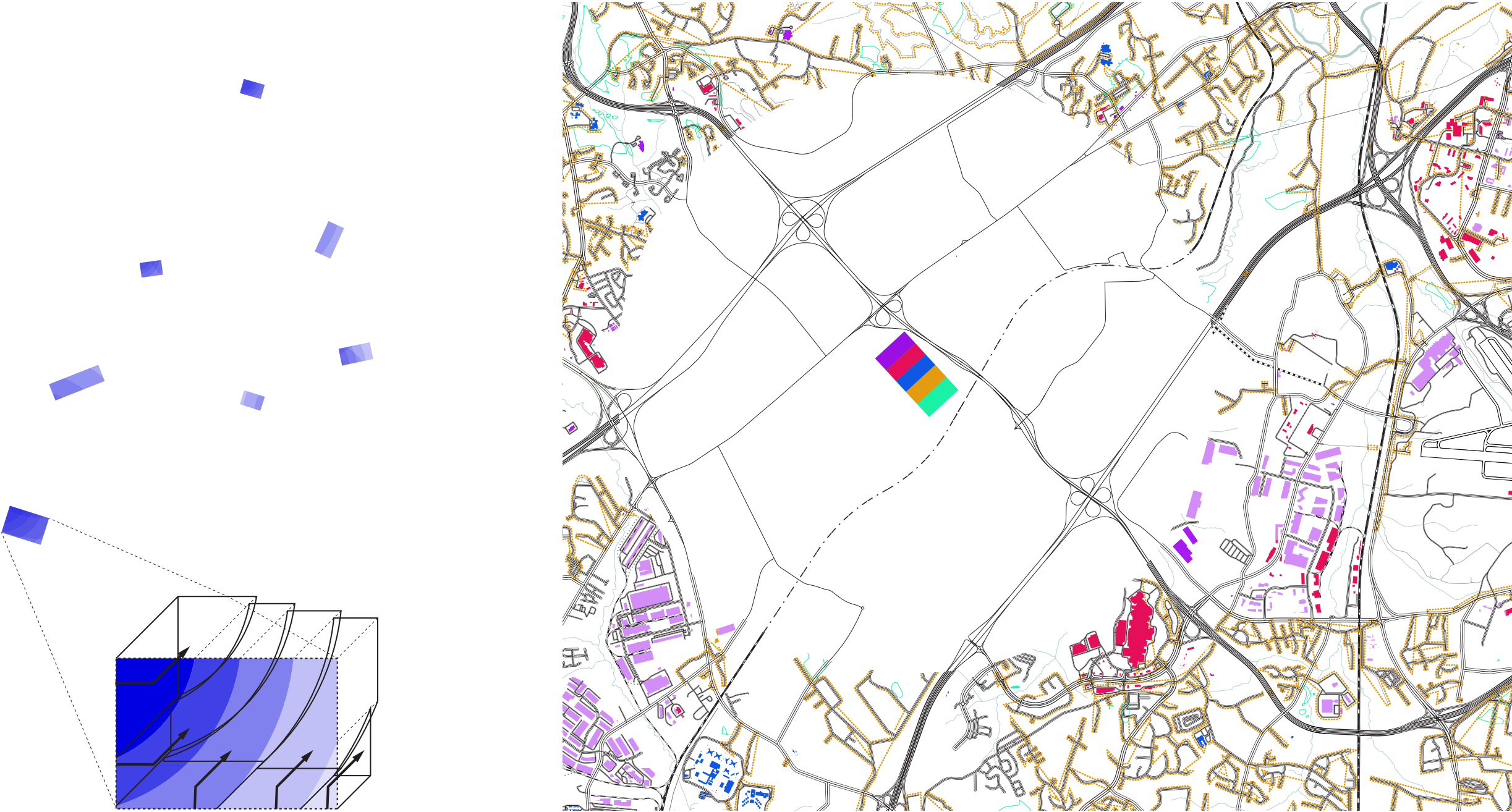
contextual surface types/differences absorbed into its  
finite architectural container





surrounding surface area once occupied by diffuse  
program returns to natural void:

the model of the peripheral urban environment  
switches from centrifugal to centripetal

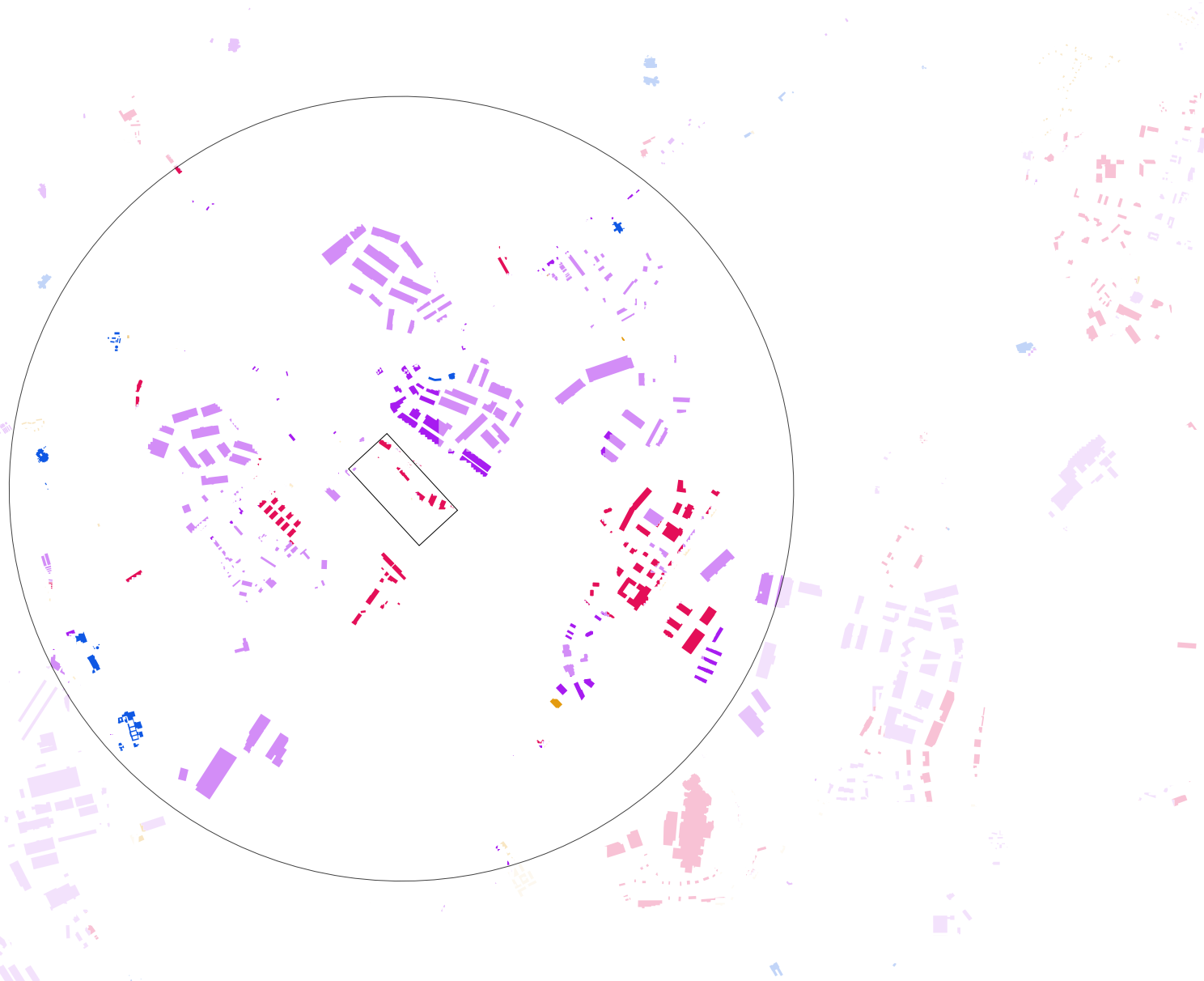


program: 525,106,625 sf

site: 350,330,306 sf

program: 80,000,000 sf

site: 3,000,000 sf

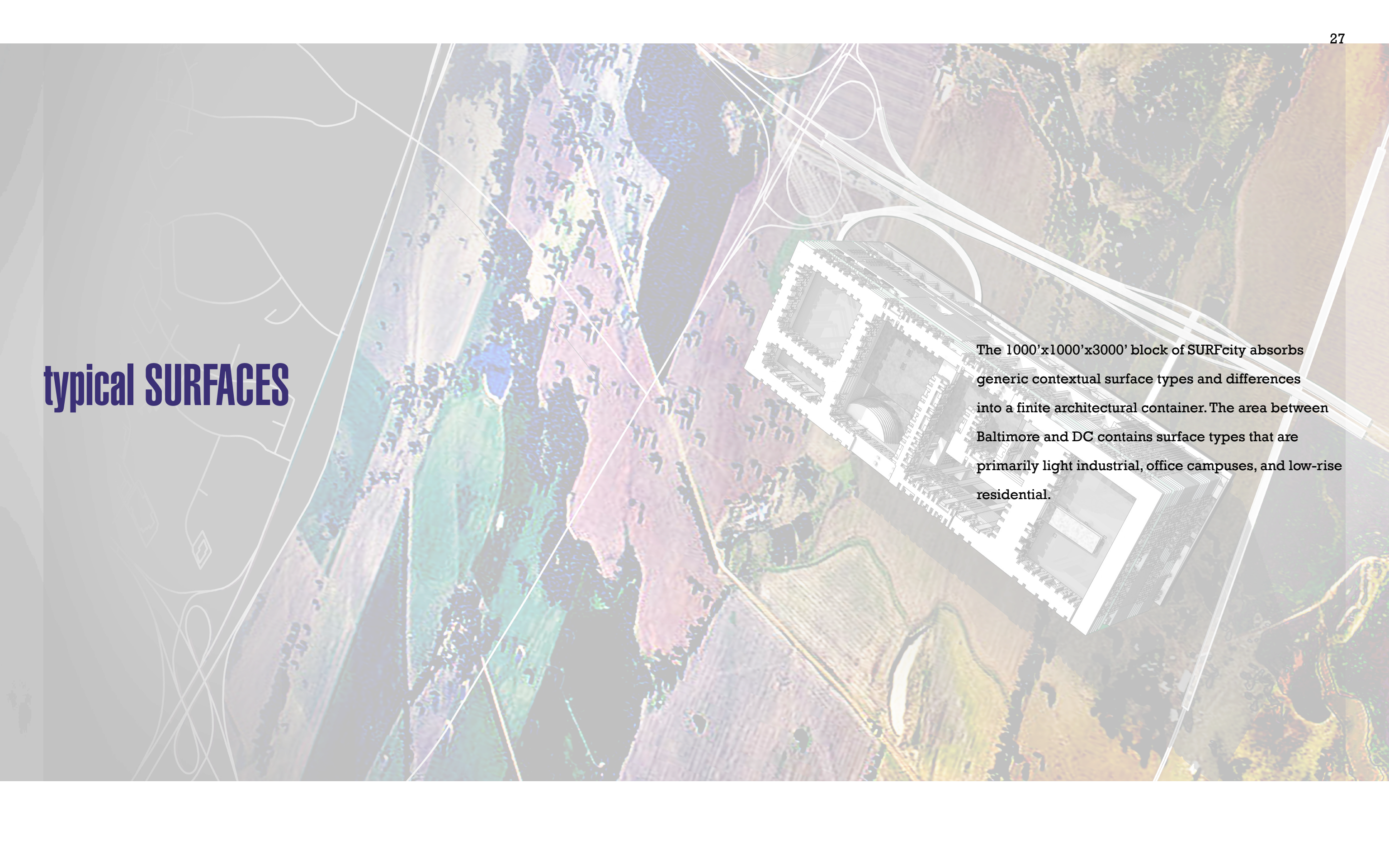


Existing Floor Area Ratio = 1.5

Proposed Floor Area Ratio = 26.67



# typical SURFACES

An aerial photograph of a landscape featuring a mix of green fields, brown agricultural land, and a winding road. Overlaid on the right side of the image is a large, white, 3D architectural model of a building complex. The model consists of several interconnected rectangular blocks with varying heights and internal courtyards. The text is positioned to the right of the model.

The 1000'x1000'x3000' block of SURFcITY absorbs generic contextual surface types and differences into a finite architectural container. The area between Baltimore and DC contains surface types that are primarily light industrial, office campuses, and low-rise residential.





industrial

35%



office

20%

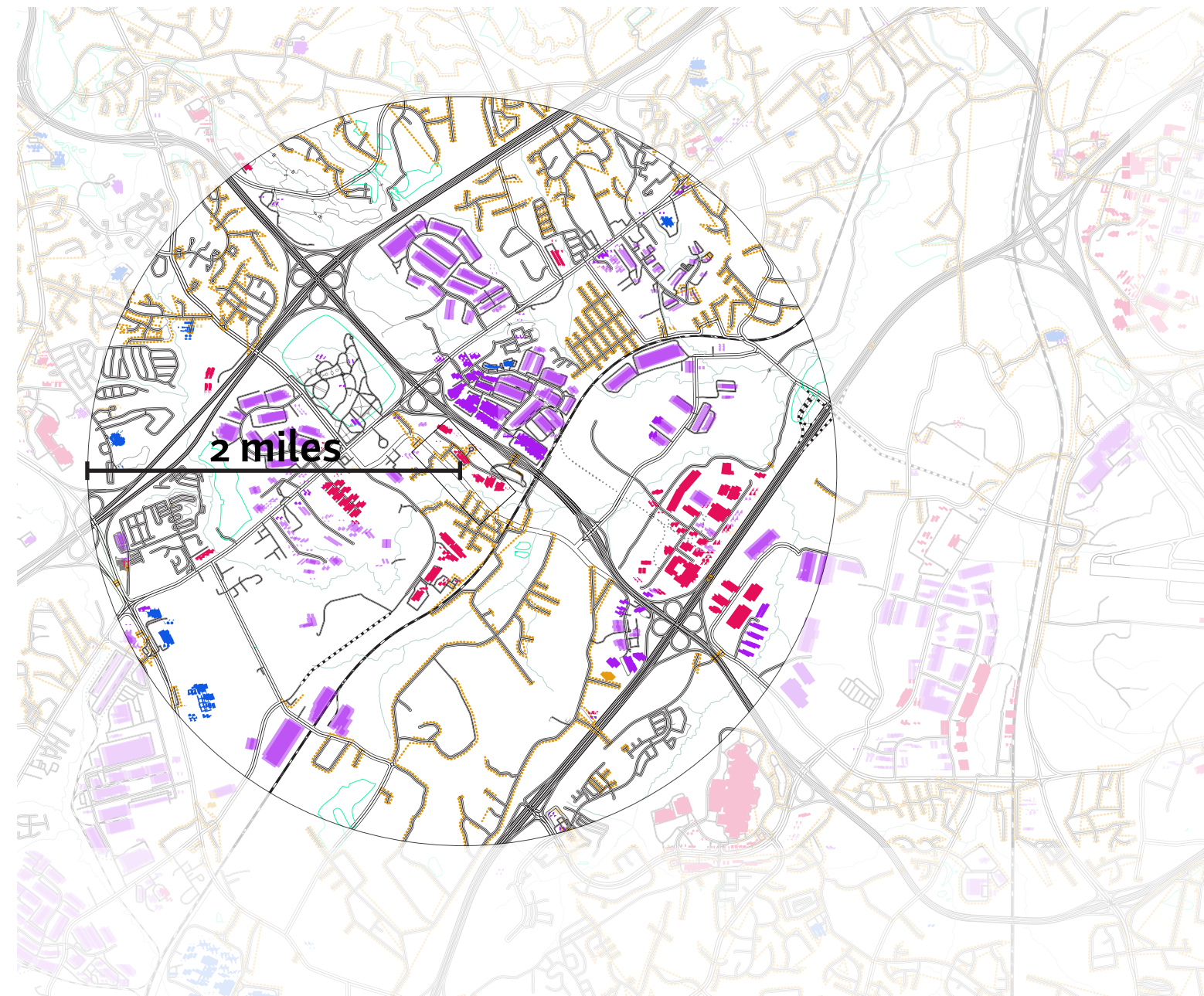


residential

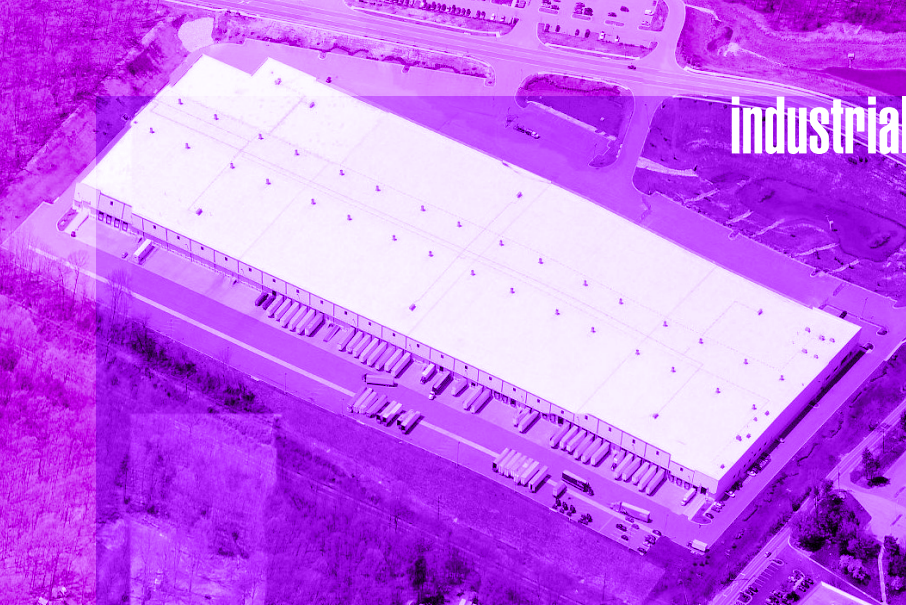
35%

## in CONTEXT

SURFcity incorporates a census of the surface uses and types within a 2 mile radius of the site.







industrial

25%



office

25%

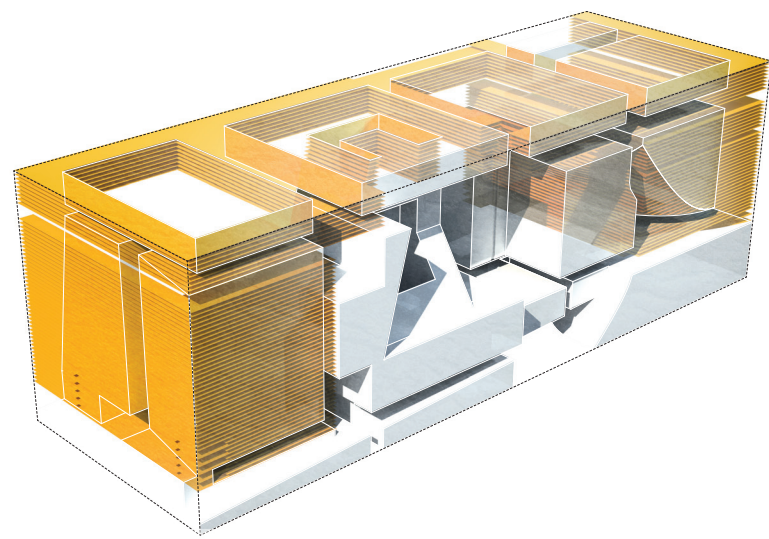
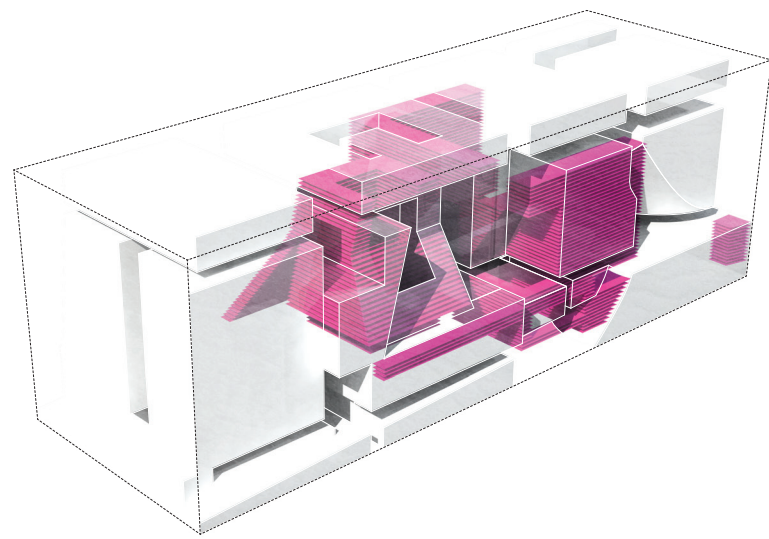
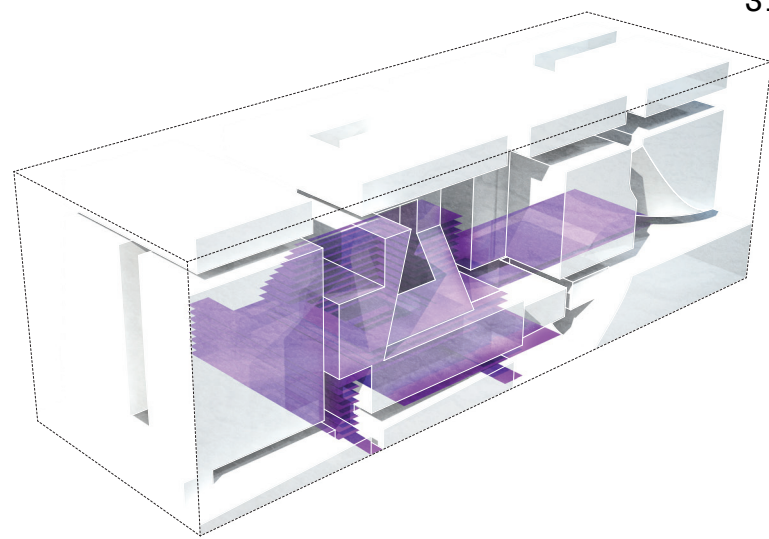


residential

50%

## in SURFcity

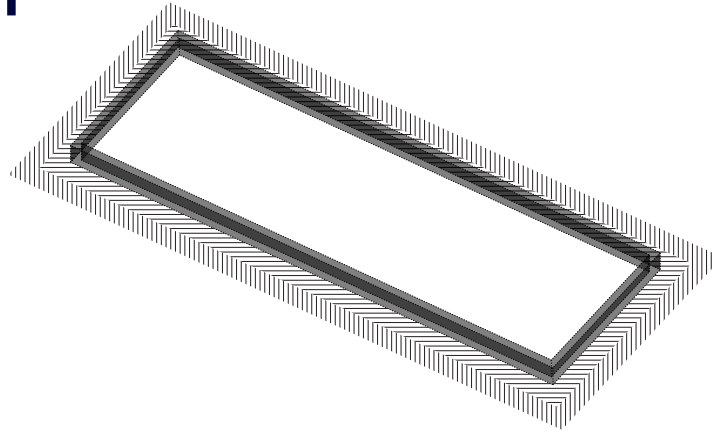
These programs are reorganized into the block, maintaining their existing surface relationships, while engendering new possibilities through adjacency and density.



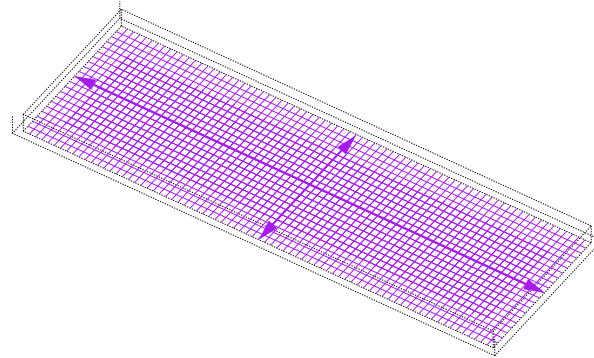


# industrial type in CONTEXT

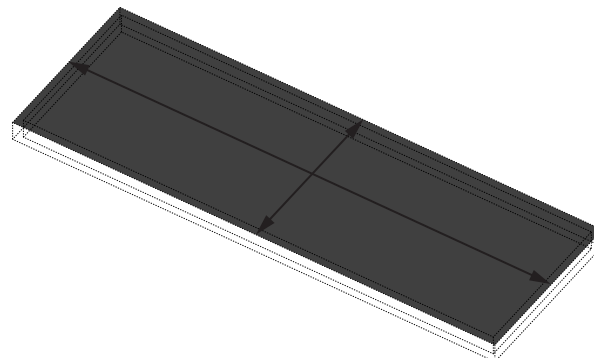
service SURFACES



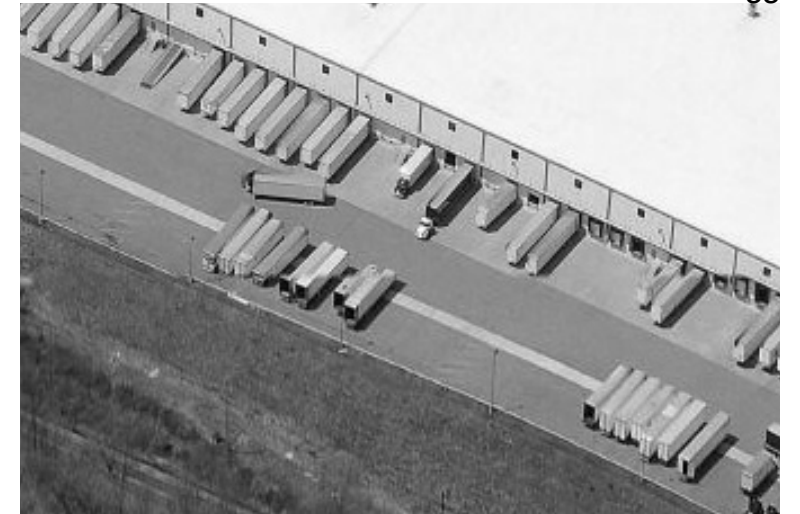
useful SURFACES



useless SURFACES



100' foot truck-service buffer  
+ 40' front-of-house core



interior production surface

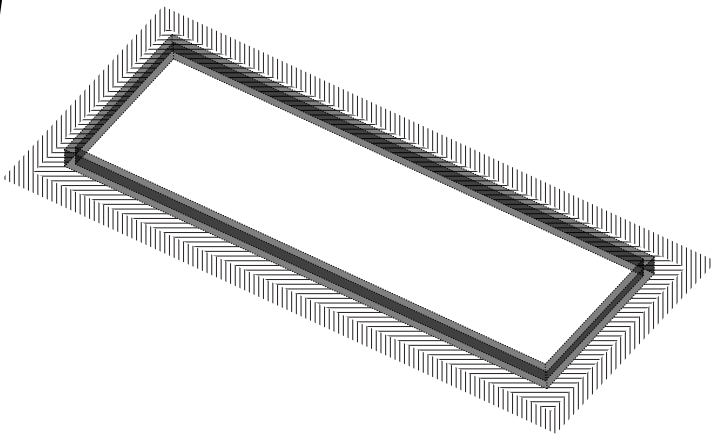


expansion of ideal interior  
production environment  
leads to the expansion of  
an under-utilized horizontal  
surface

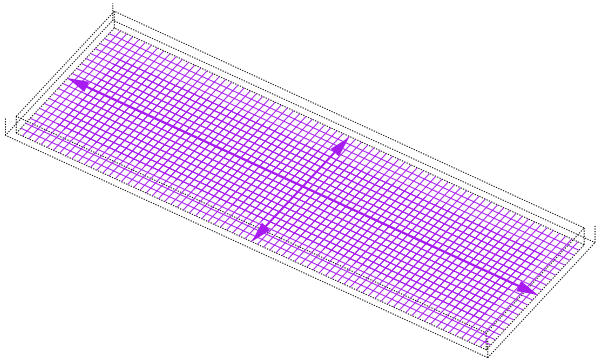


industrial type in SURFcity

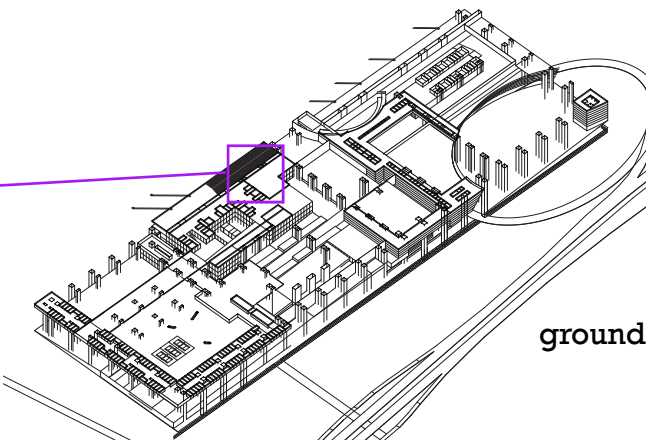
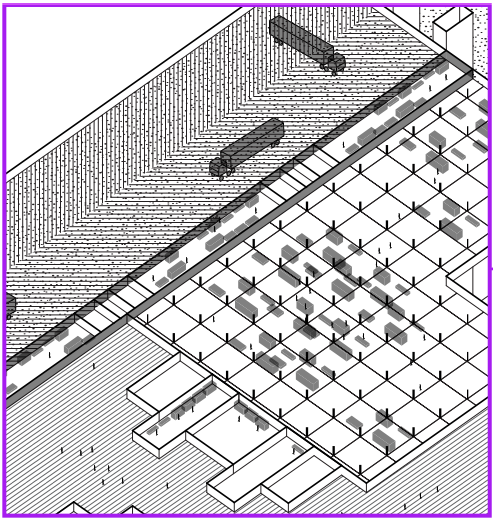
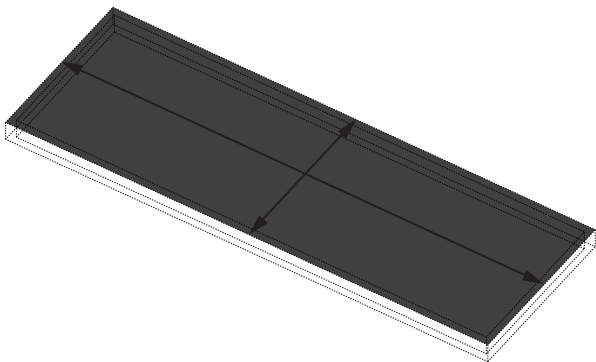
service SURFACES



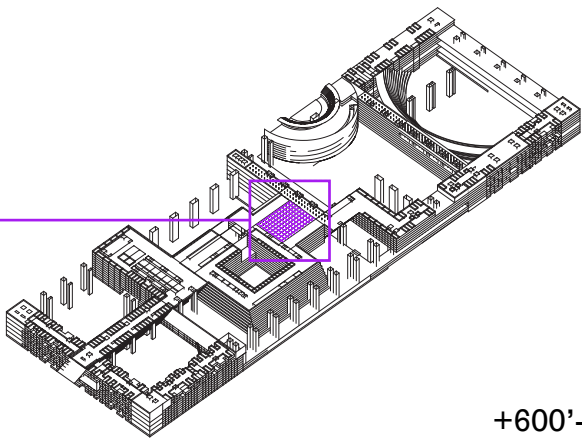
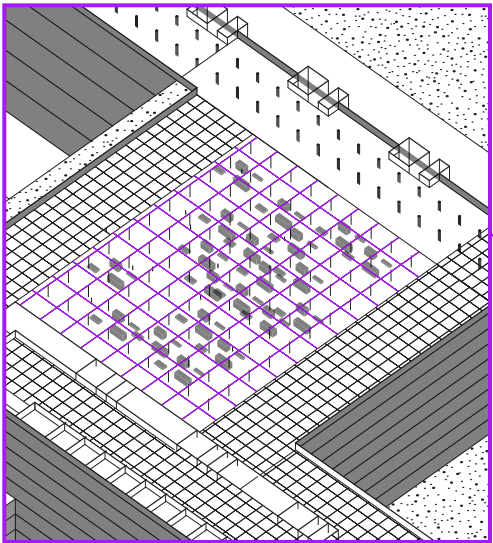
useful SURFACES



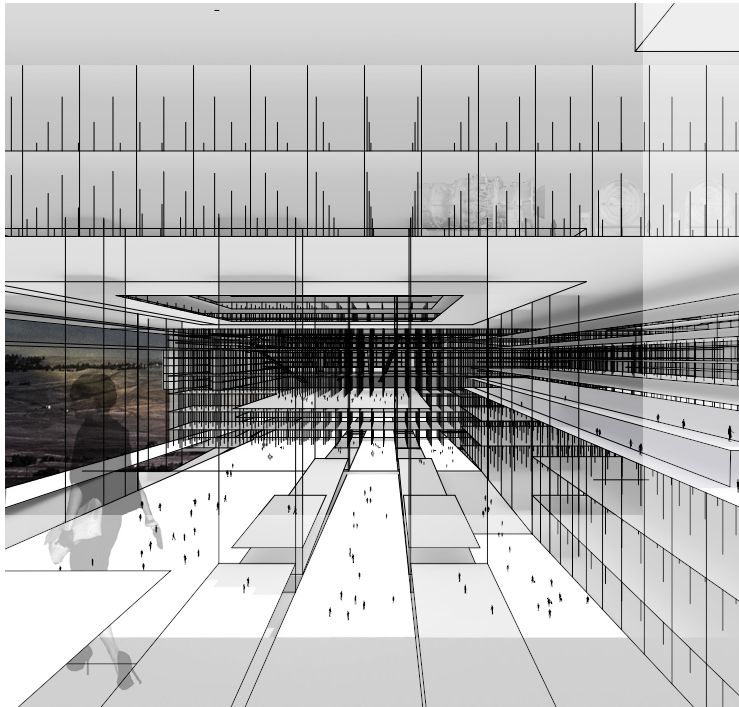
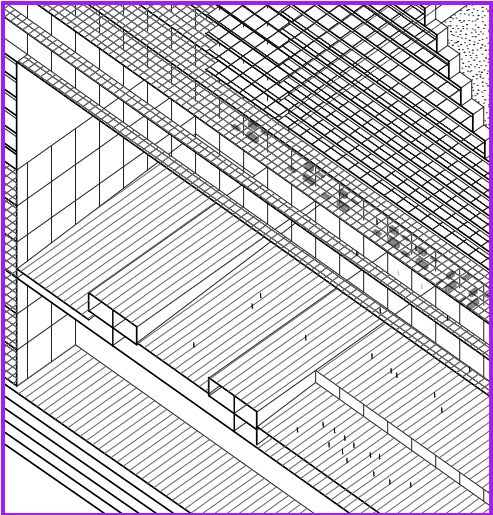
useless SURFACES



ground

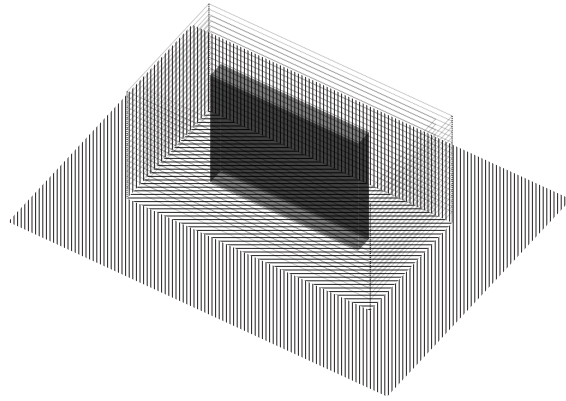


+600'-0"

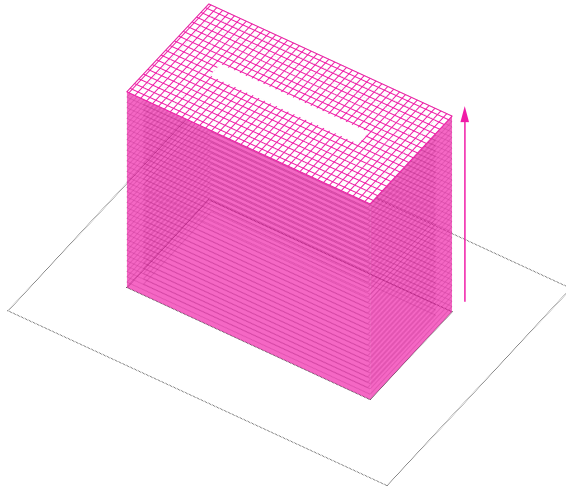




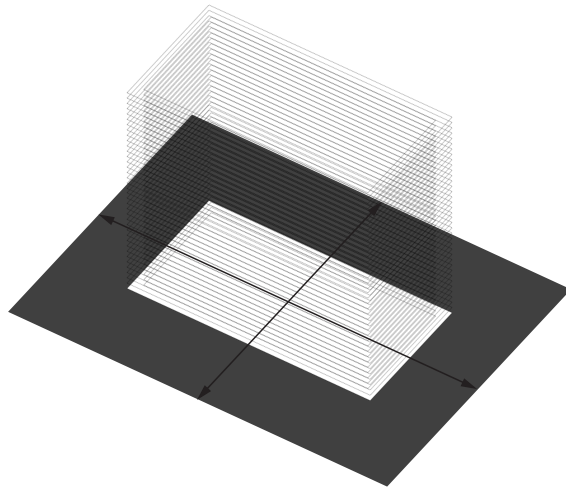
service SURFACES



useful SURFACES



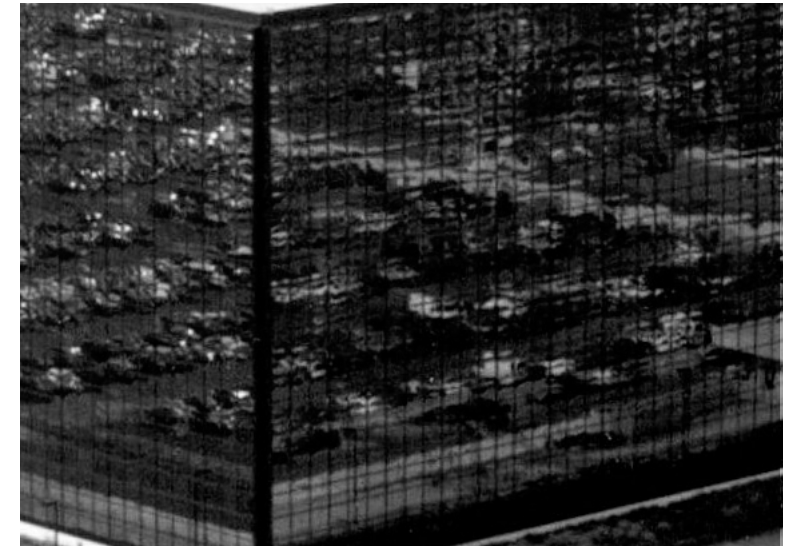
useless SURFACES



embedded vertical  
circulation and dark program  
core  
+  
parking surface

daylighting surface

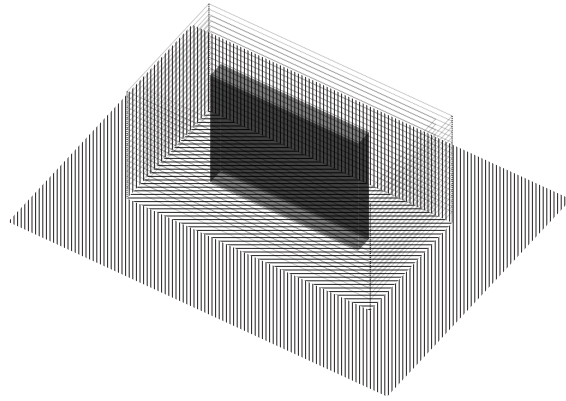
expansion of ideal daylit  
working environment leads  
to the expansion of exterior  
void surfaces (open space/  
parking) to support



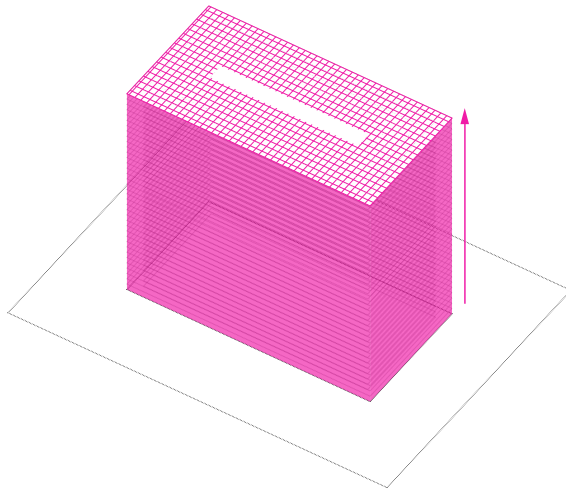


# office type in SURFcity

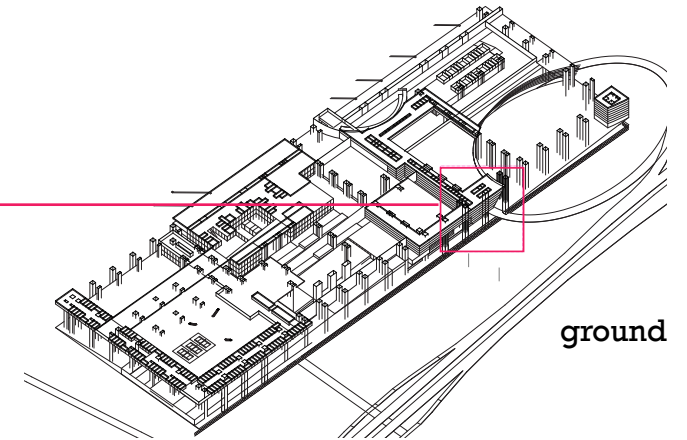
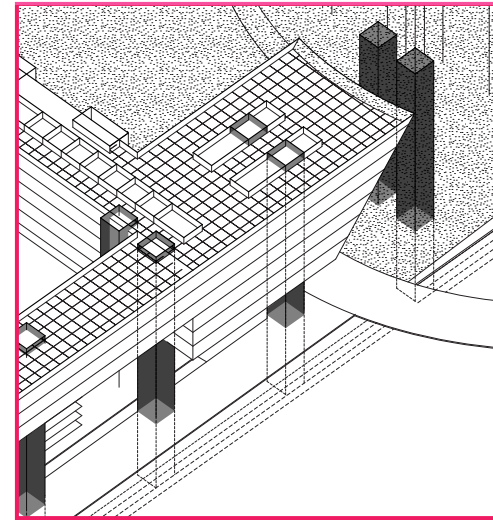
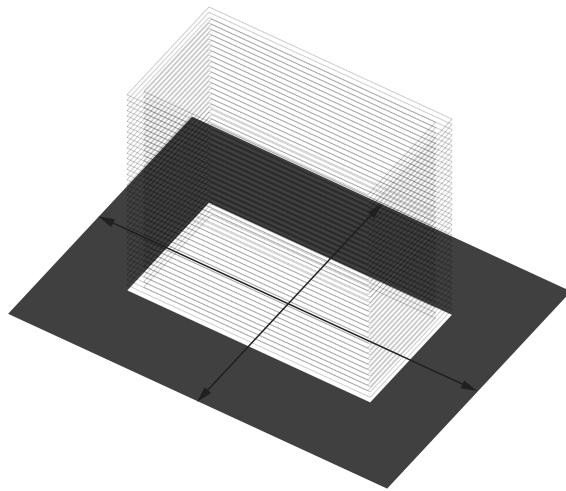
service SURFACES



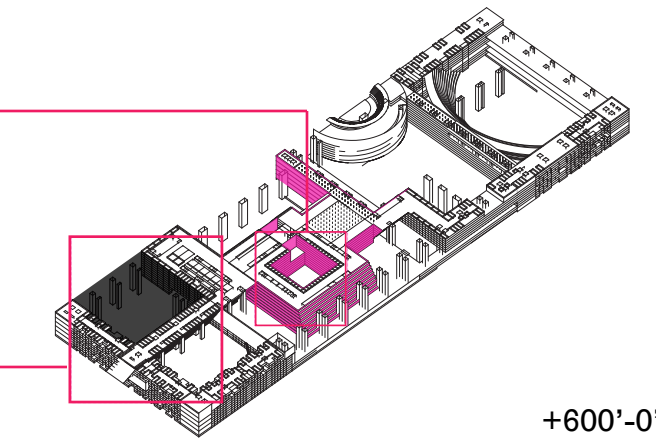
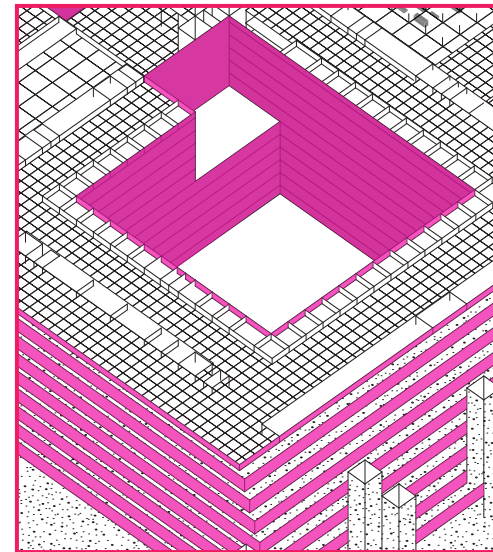
useful SURFACES



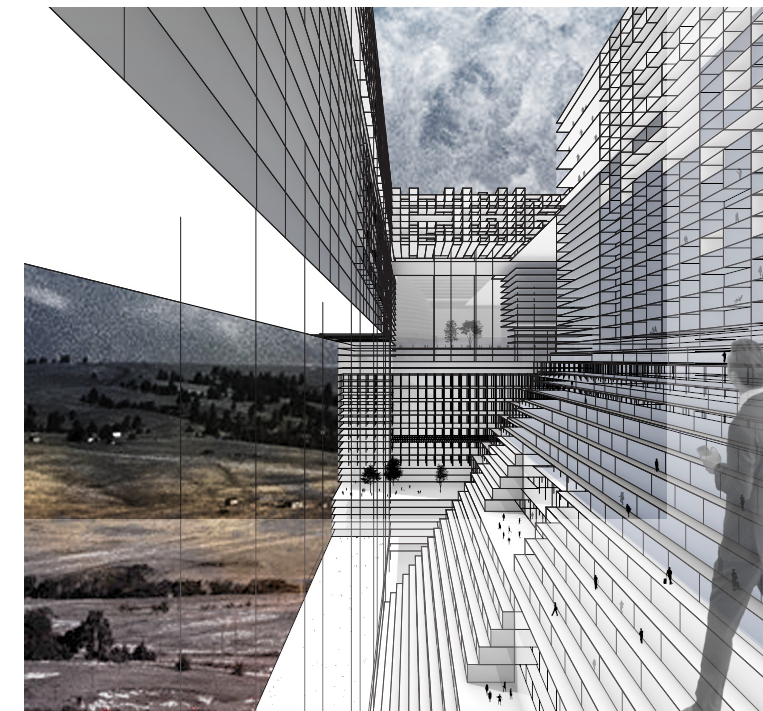
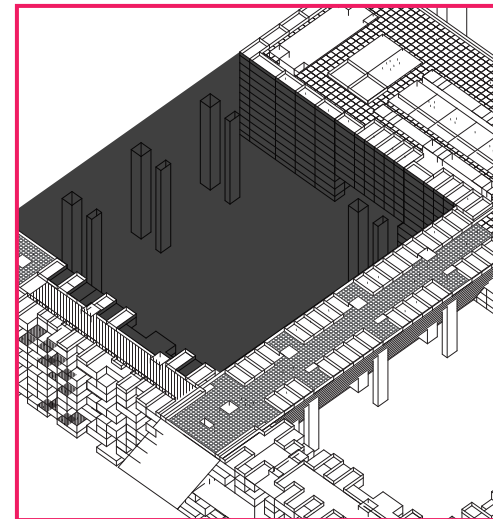
useless SURFACES



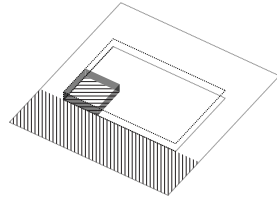
ground



+600'-0"





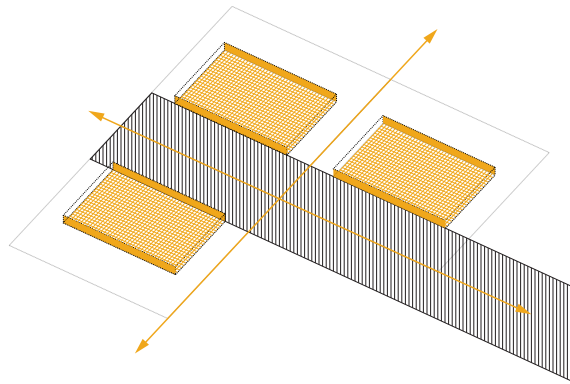


service SURFACES

garage + street access



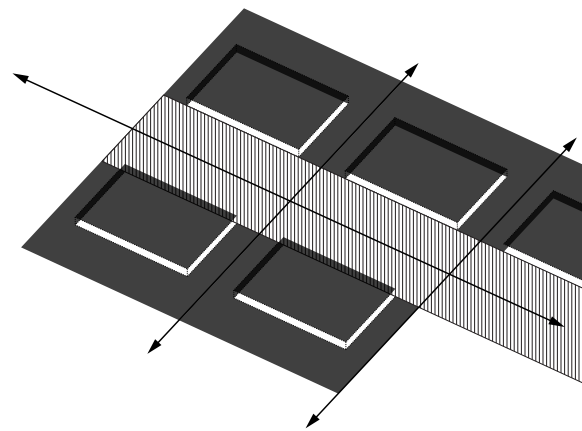
useful SURFACES



individualized, private,  
interior surface  
+  
front (street) and back (yard)  
surfaces



useless SURFACES

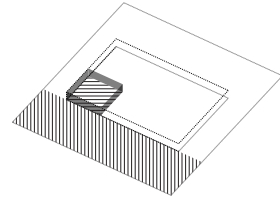


expansion of ideal living  
environment leads to the  
expansion of exterior void  
surfaces (open space/  
parking) and under-utilized  
horizontal surfaces

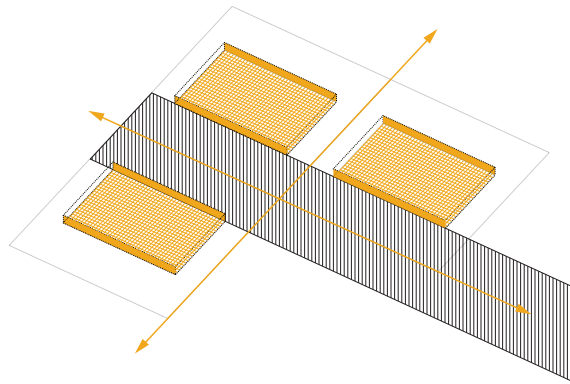


# residential type in SURFcity

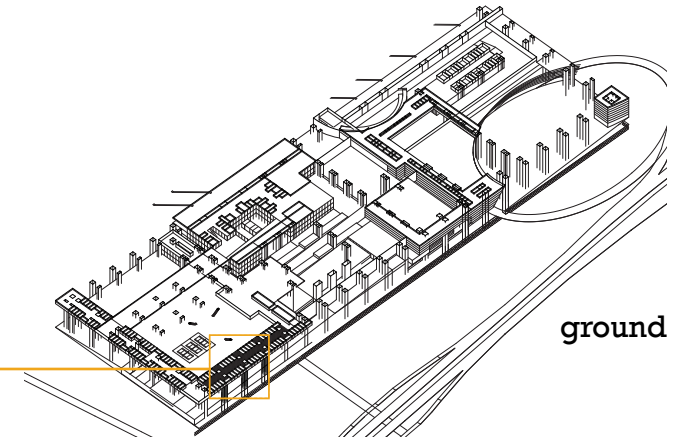
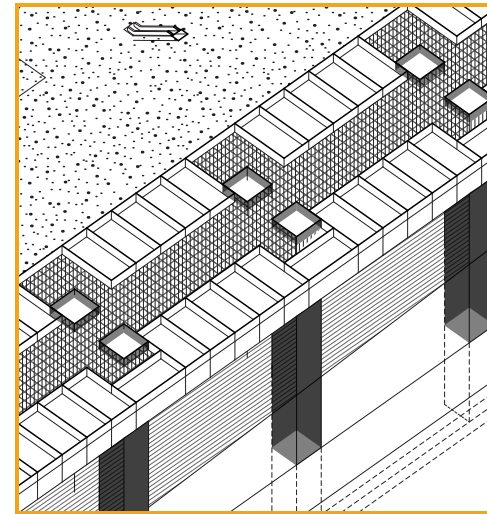
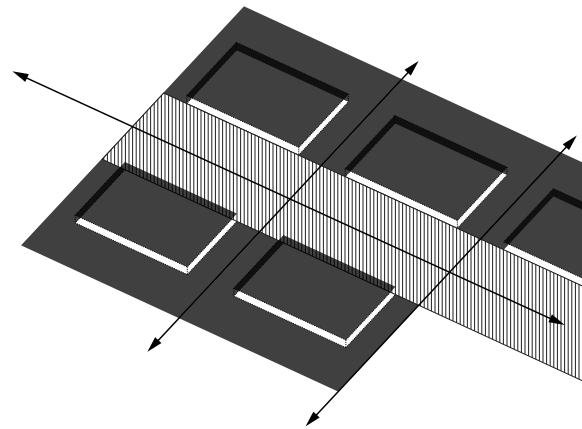
service SURFACES



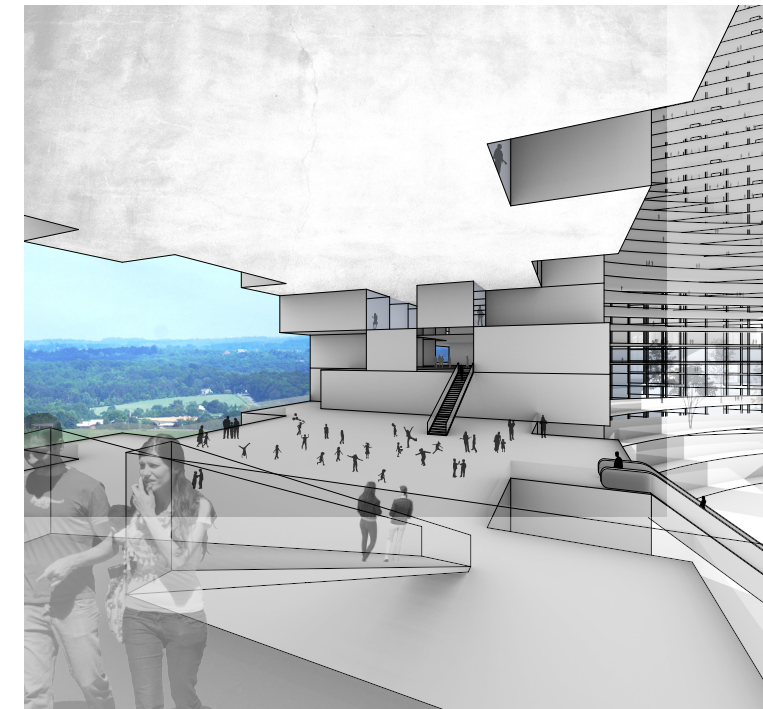
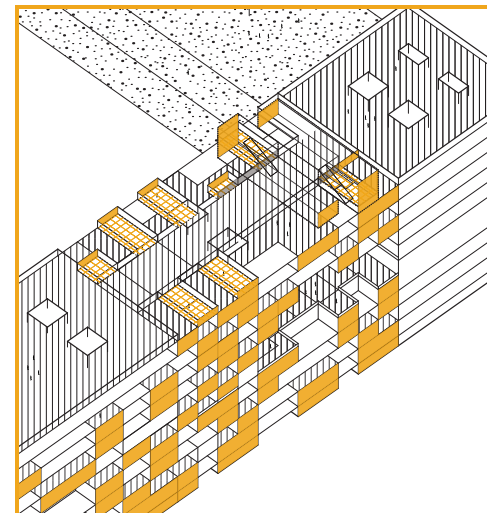
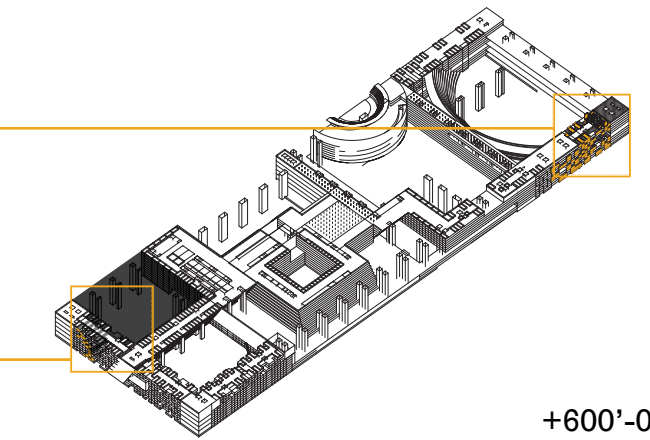
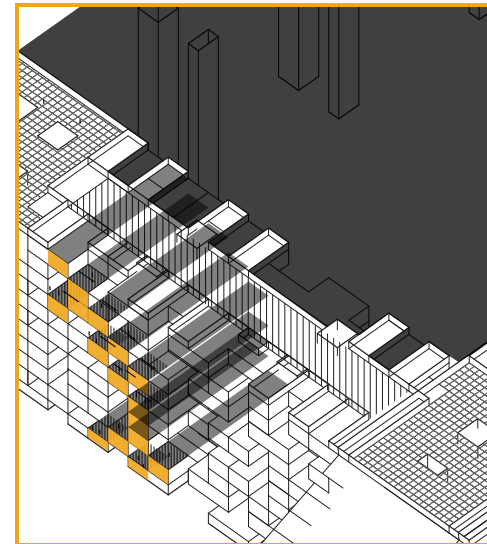
useful SURFACES



useless SURFACES



43

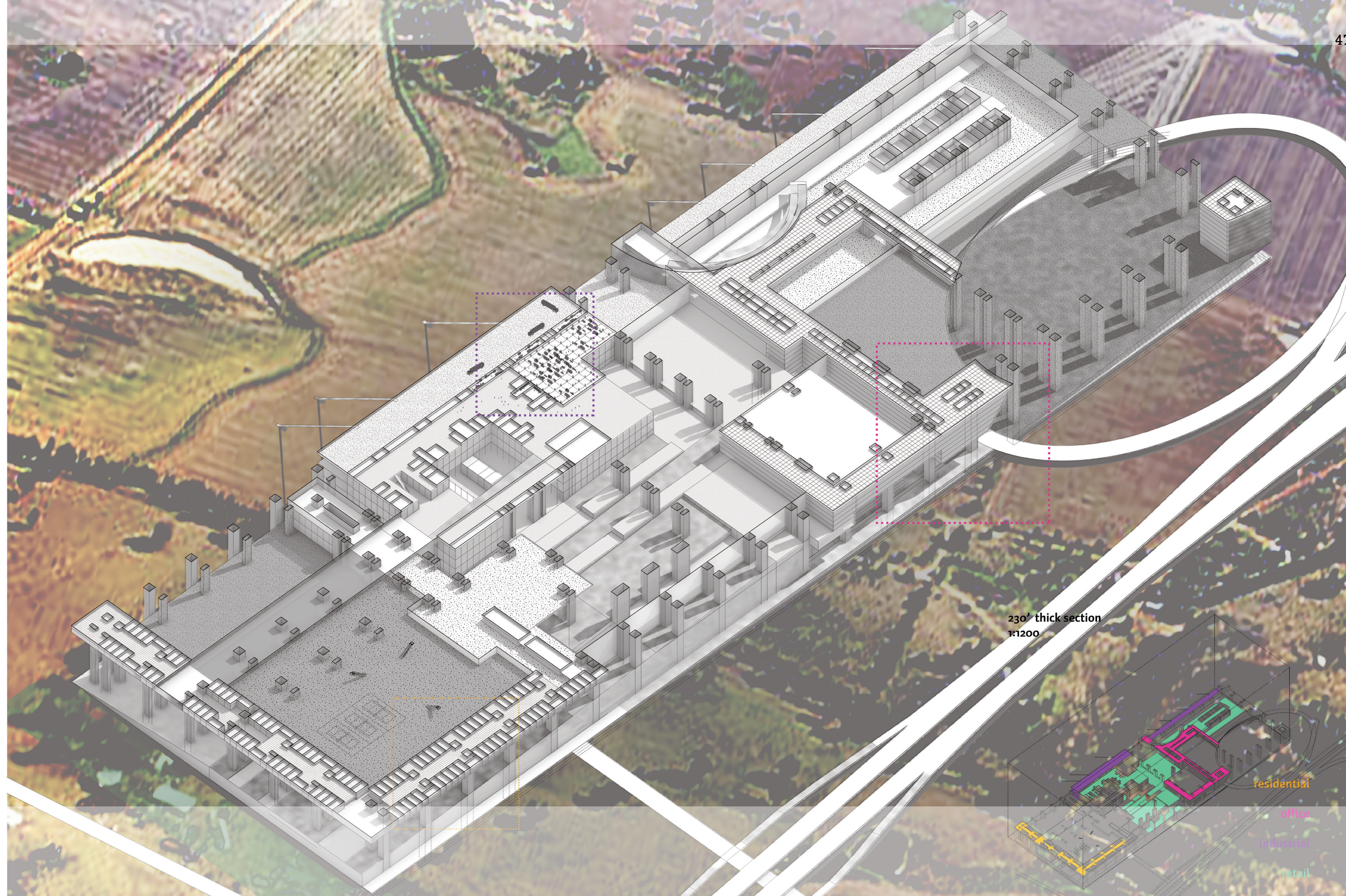


# low levels

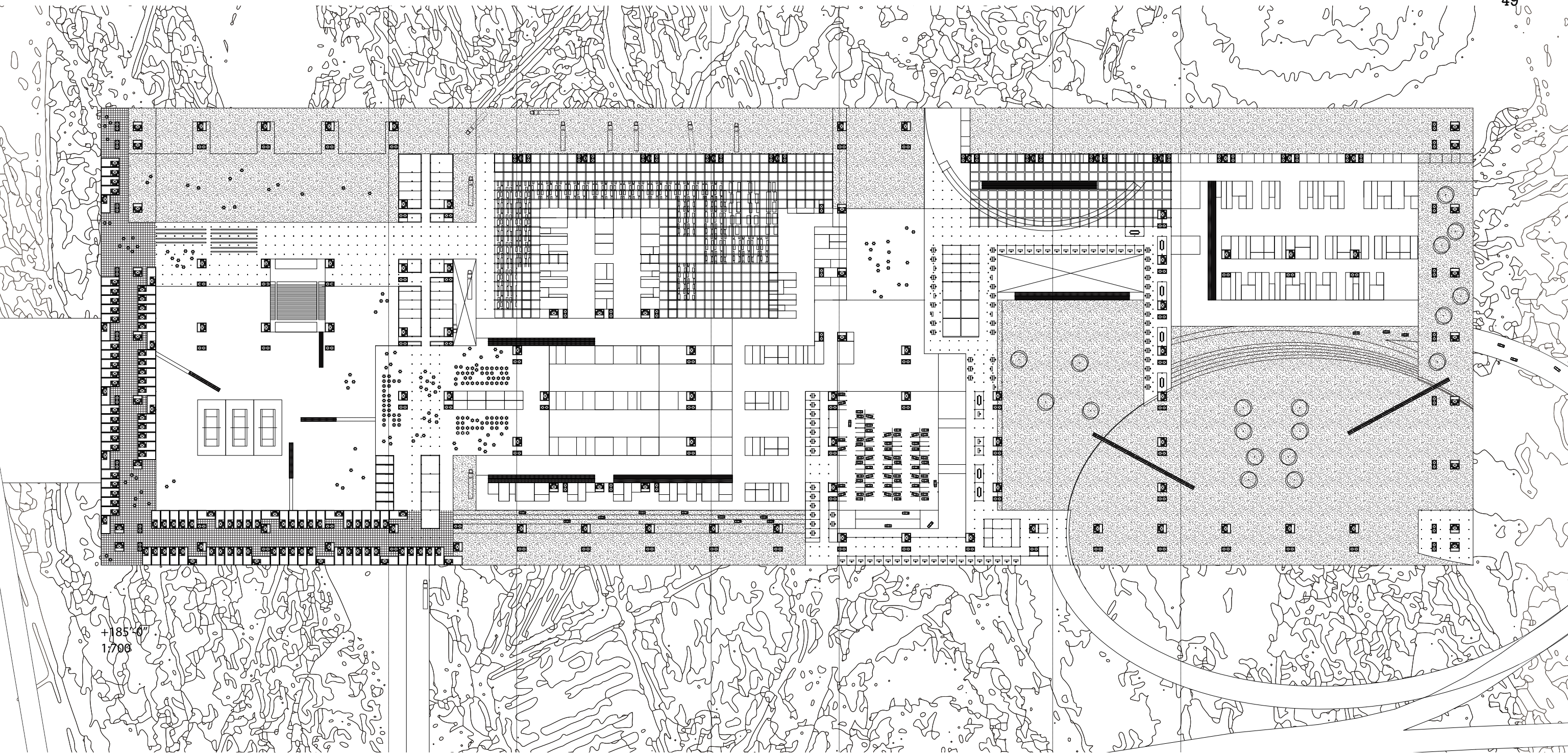
The recombination of existing surface types is explored through a series of ‘thick plans’ (100’-300’ thick horizontal cuts across the 1000’ x 3000’ site), plans, and perspectives.

The lower levels are primarily public surfaces, parks (interior/exterior), lobbies, retail space, and support programs, all connected to regional infrastructures (highway and light rail)

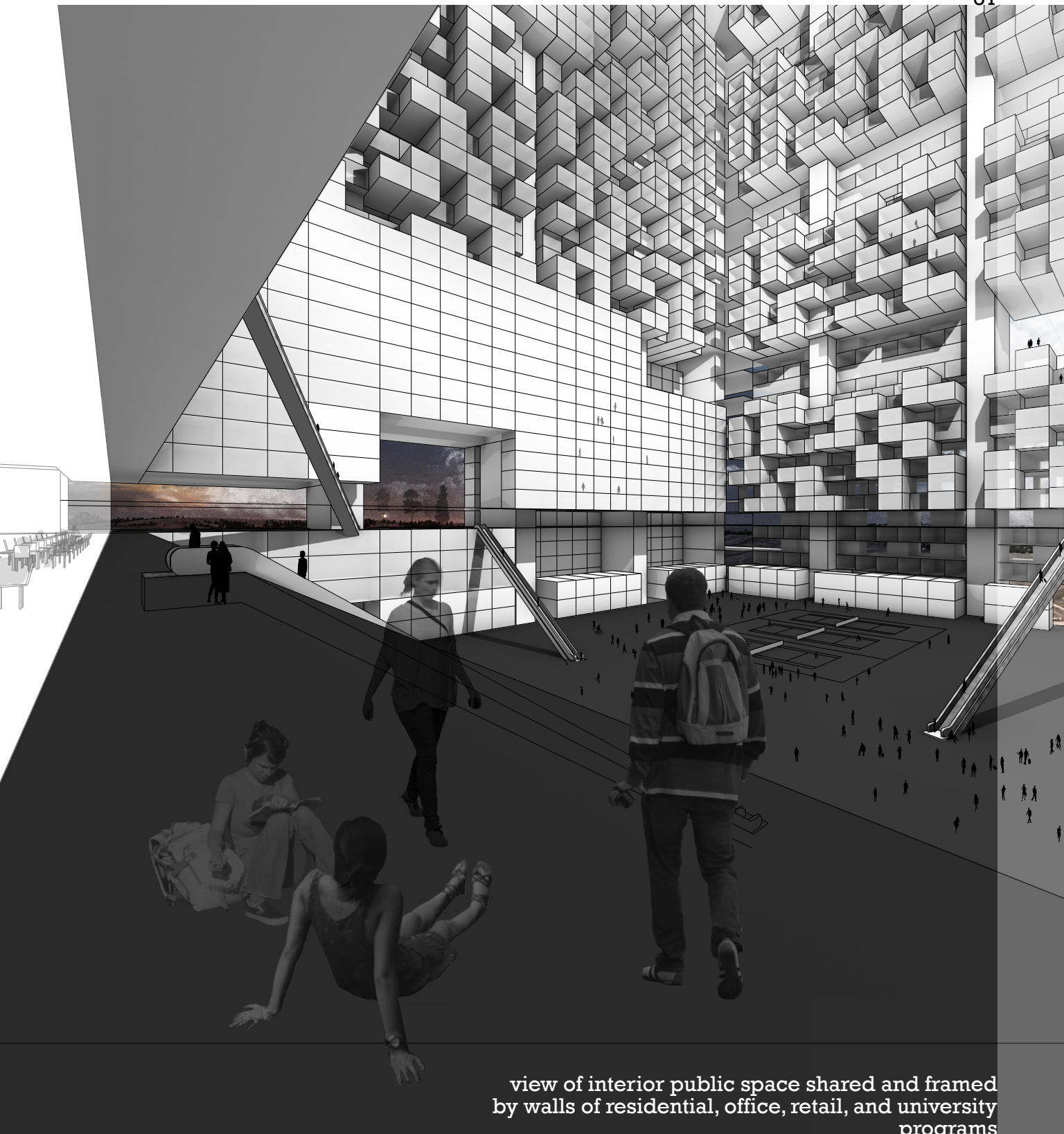








view from office space, out across interior public space of interior retail space (roof of industrial)



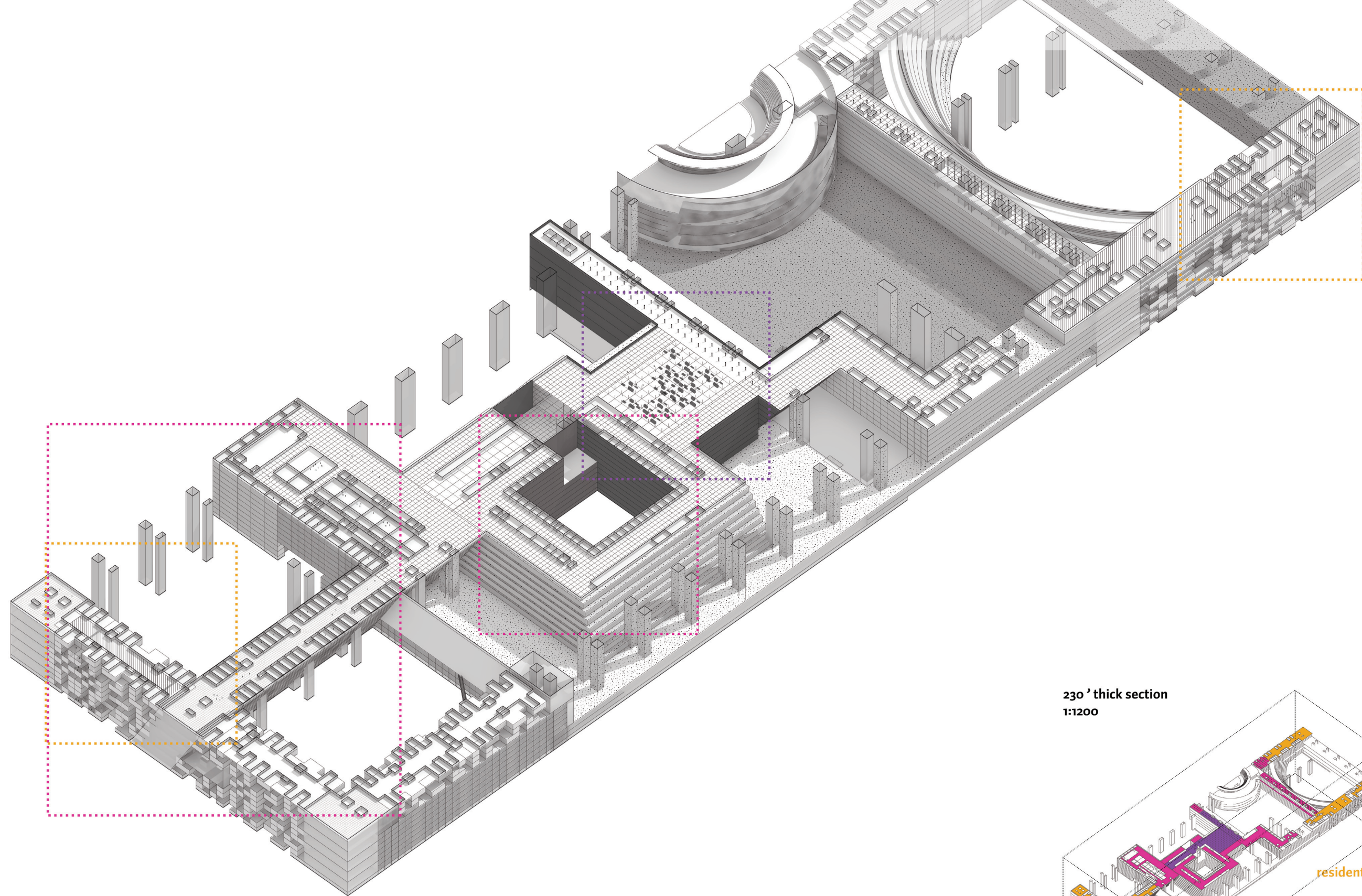
view of interior public space shared and framed by walls of residential, office, retail, and university programs



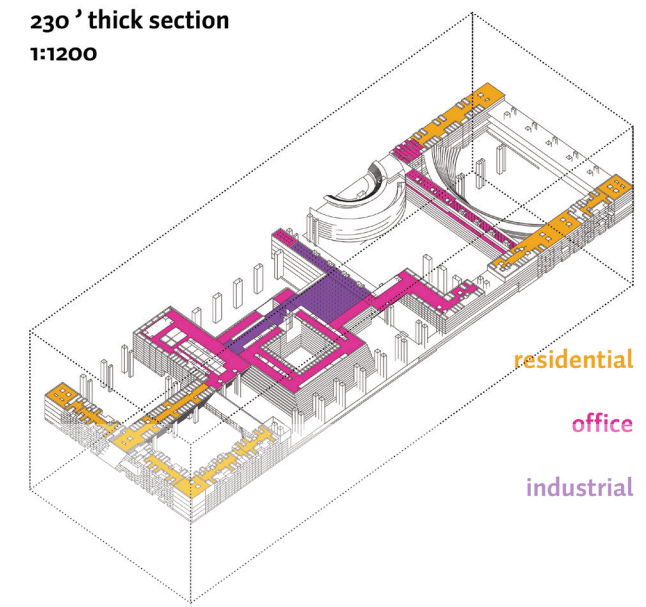
## mid levels

The middle levels are comprised of residential, office, hotel, and industrial program.

thick plan

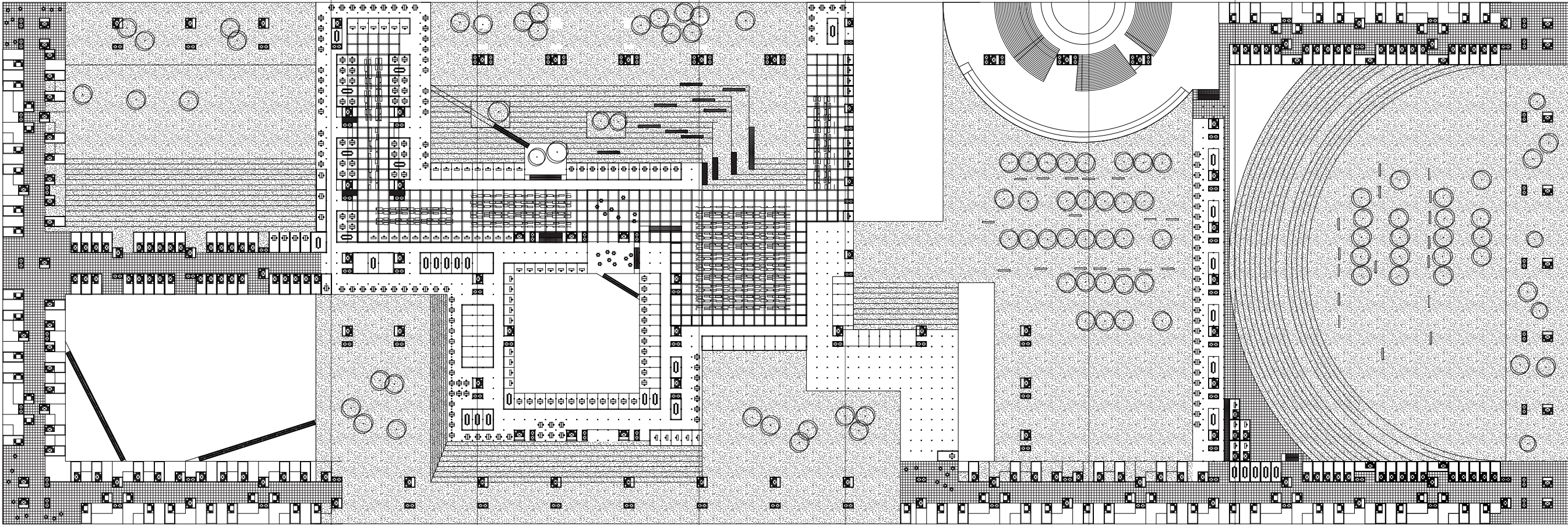


230' thick section  
1:1200



residential  
office  
industrial





+633'-0"



view from residential unit across  
interior public space, to office  
programs beyond



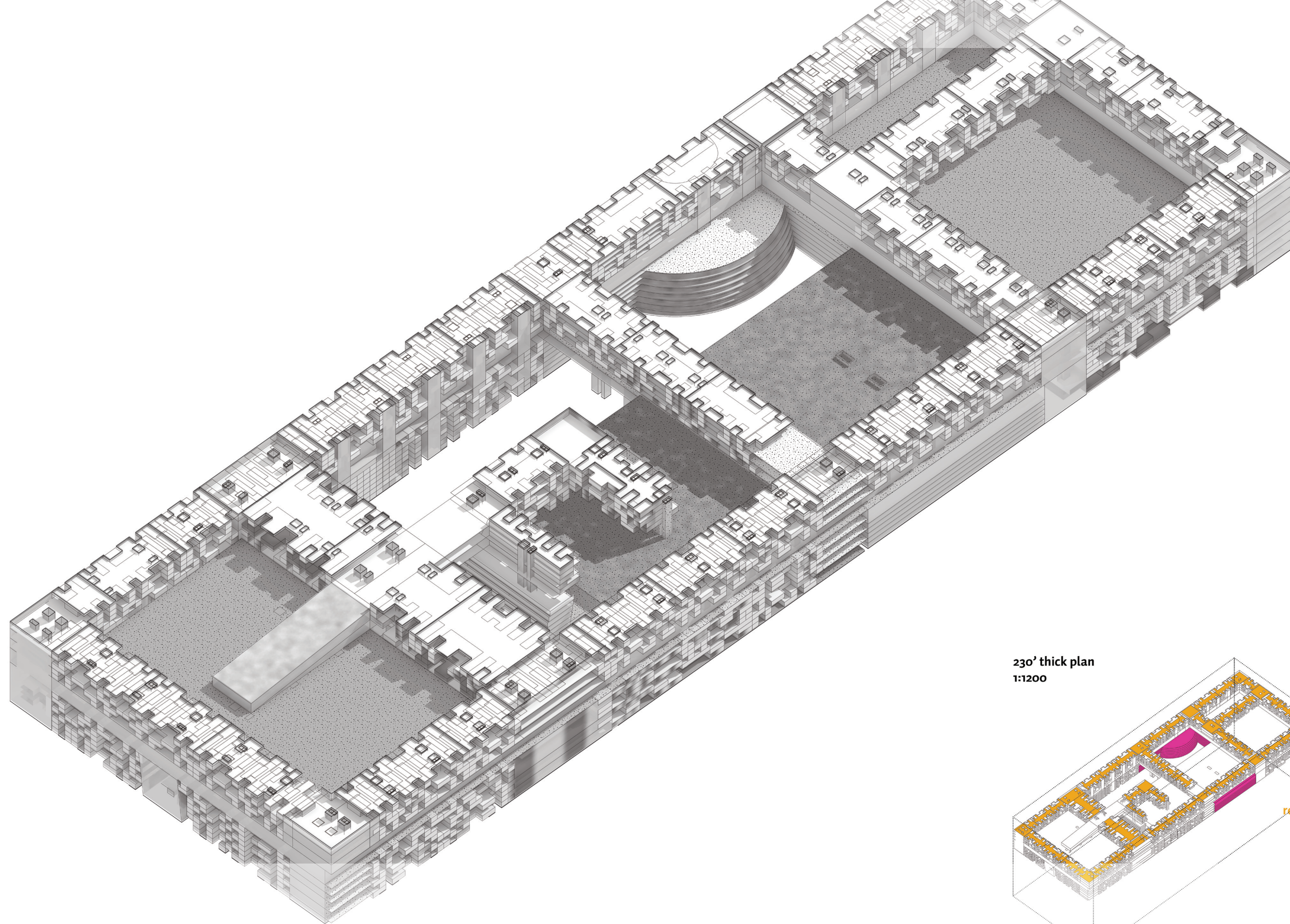
view from office space into hybrid space:  
office + industrial = rapid prototyping space



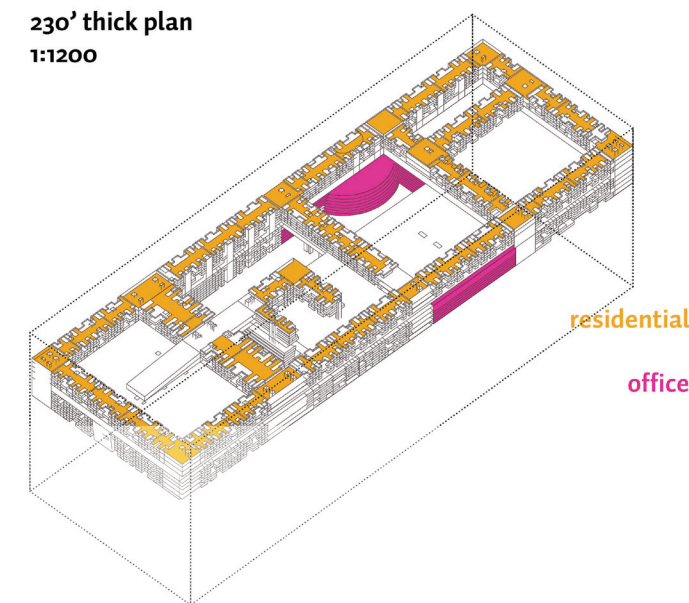
## high levels

The upper levels are comprised of residential, and residential-support program.





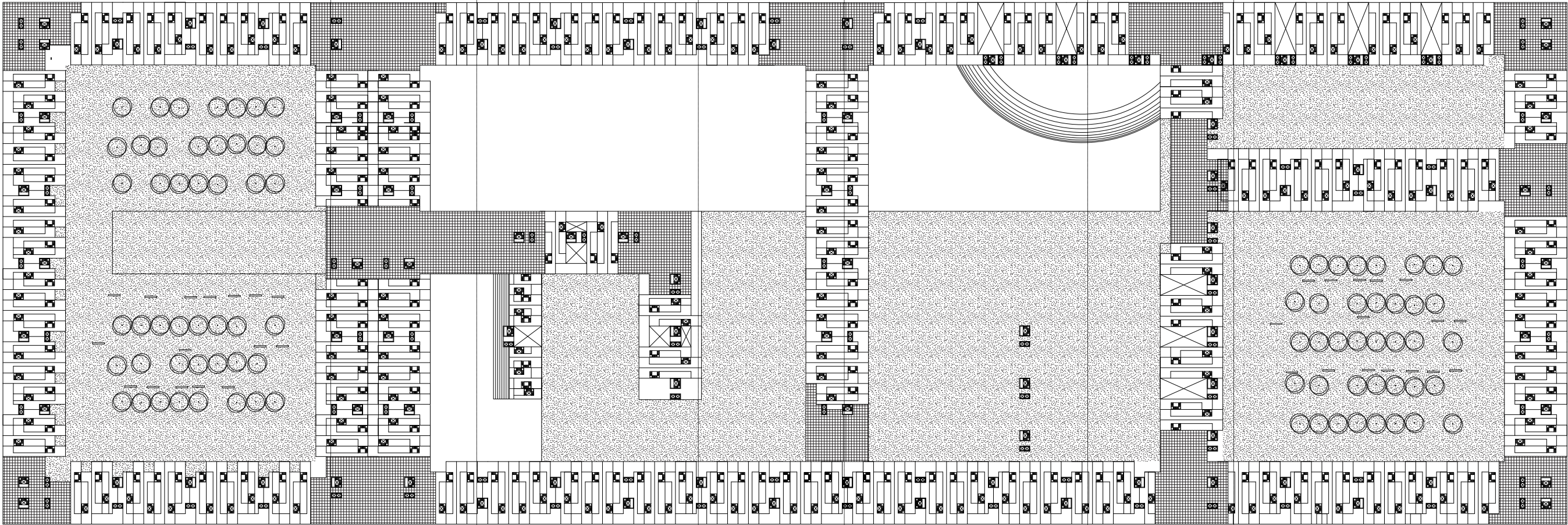
230' thick plan  
1:1200



residential

office

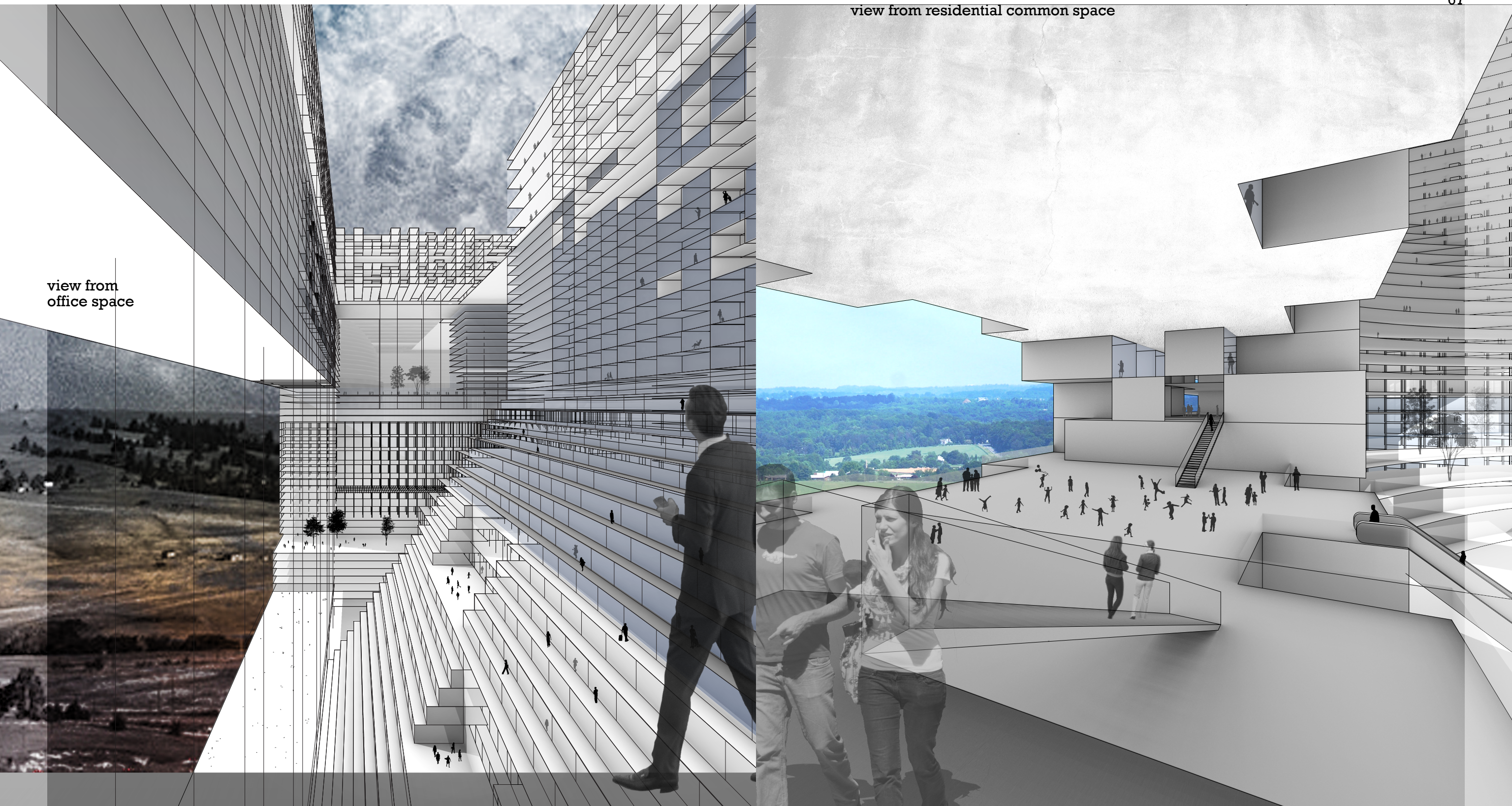




+933'-0"



view from residential common space

view from  
office space

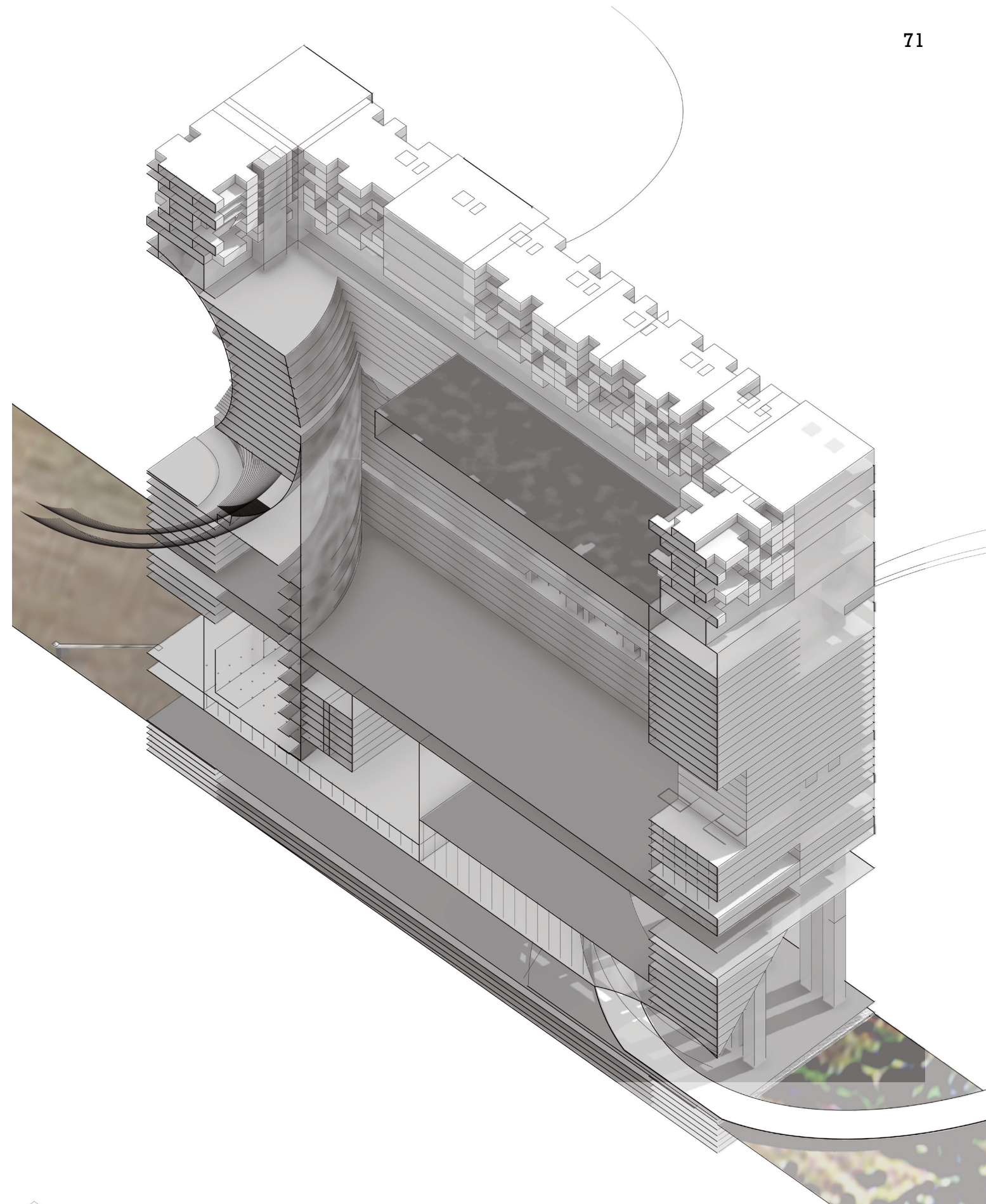
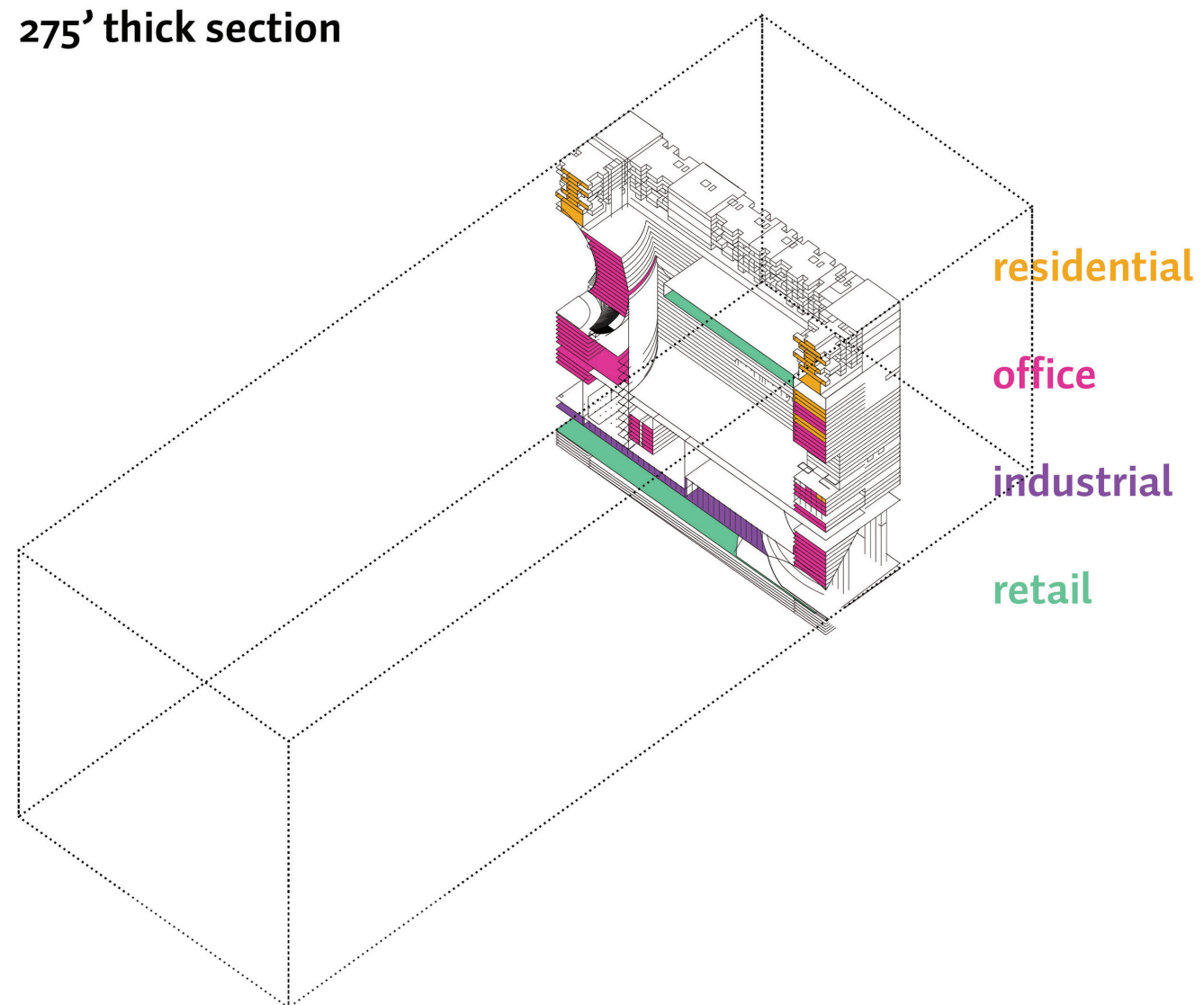


## thick sections

The dense, heterogeneous, horizontal layers are synthesized by exploring a series of ‘thick sections’ (200’-300’ thick vertical sections through the site). Shared voids and public/semi-public surfaces stitch together different programs types vertically, and are charged by these multiple and hybridized programs.

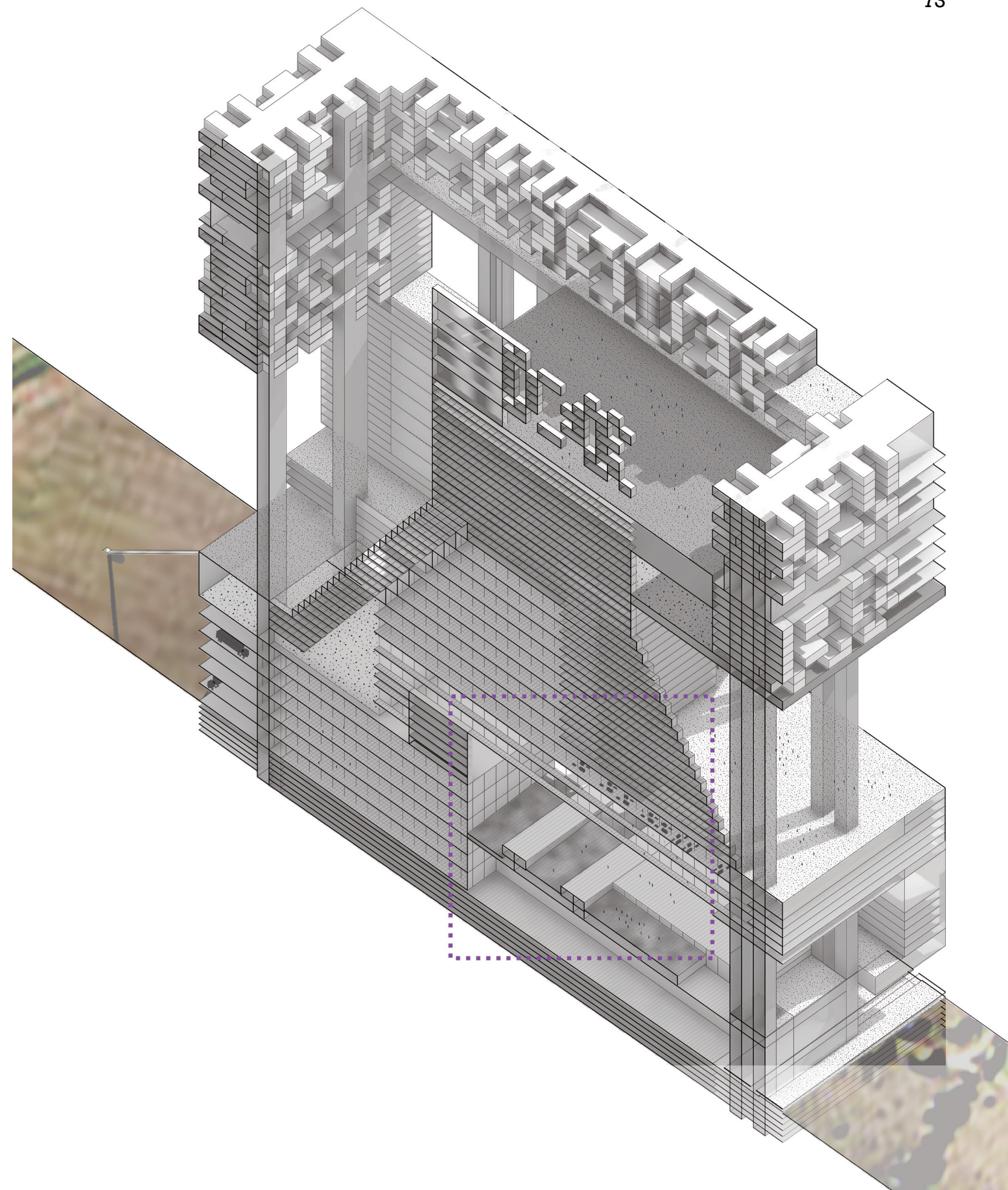
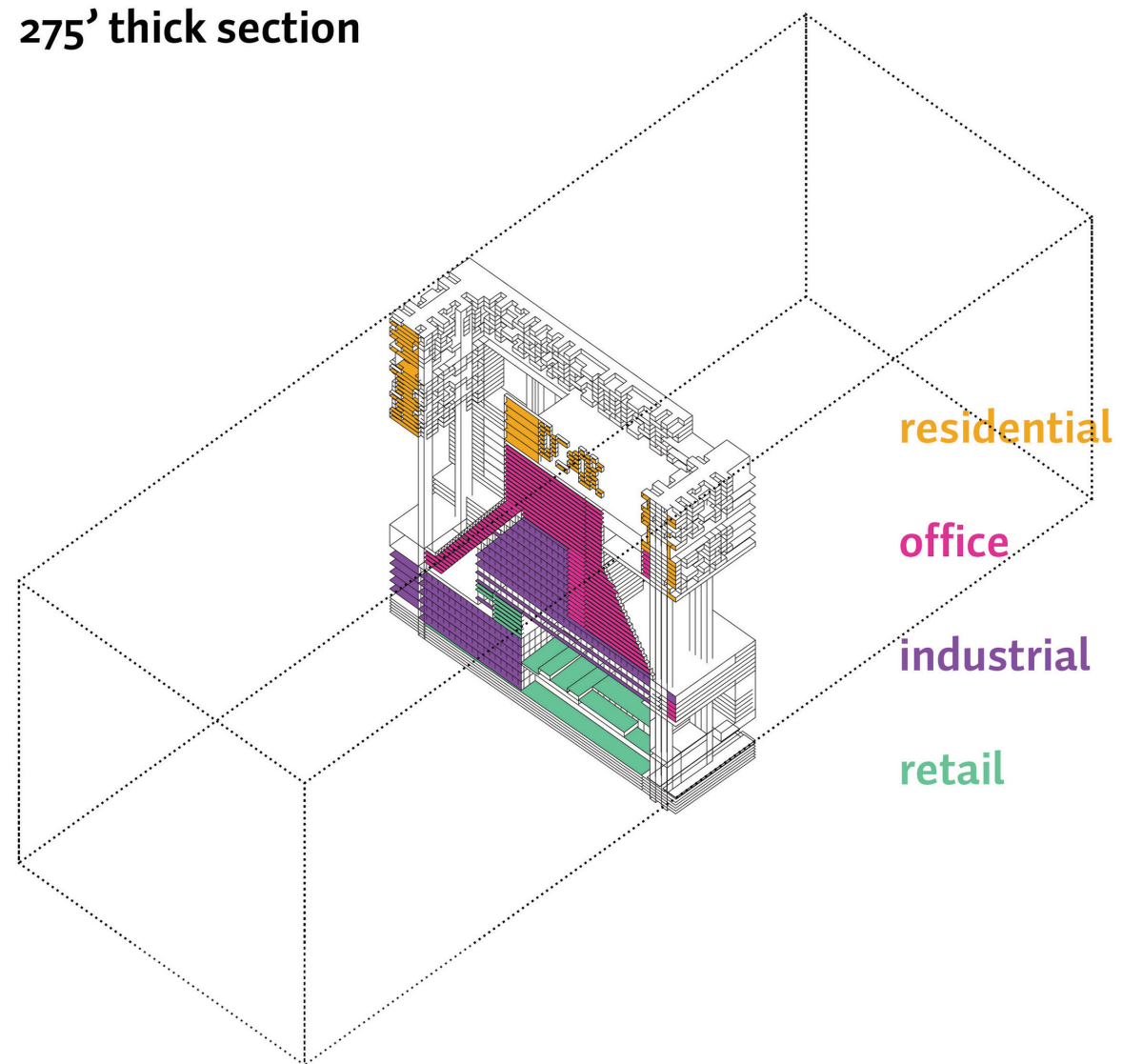


275' thick section



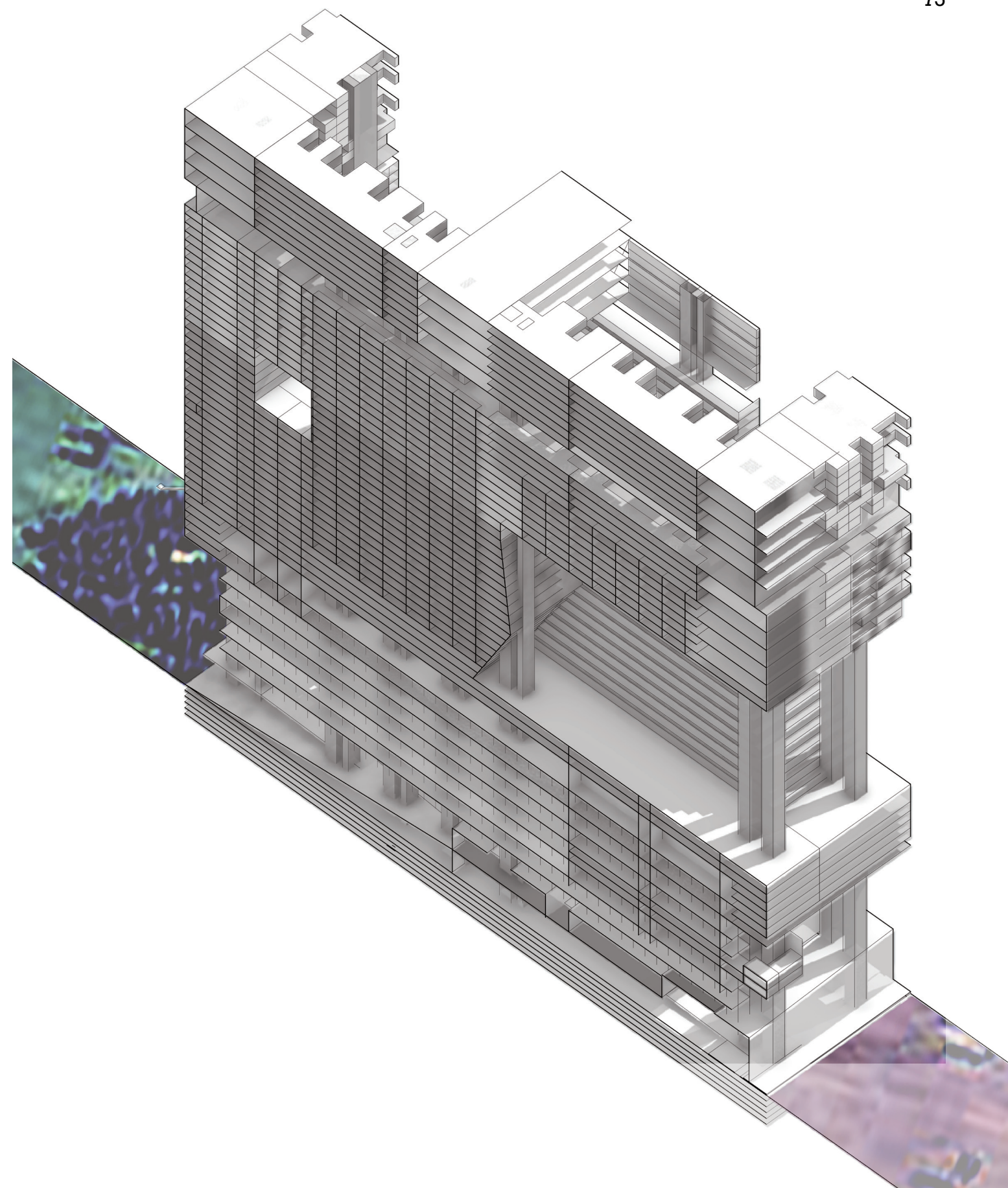
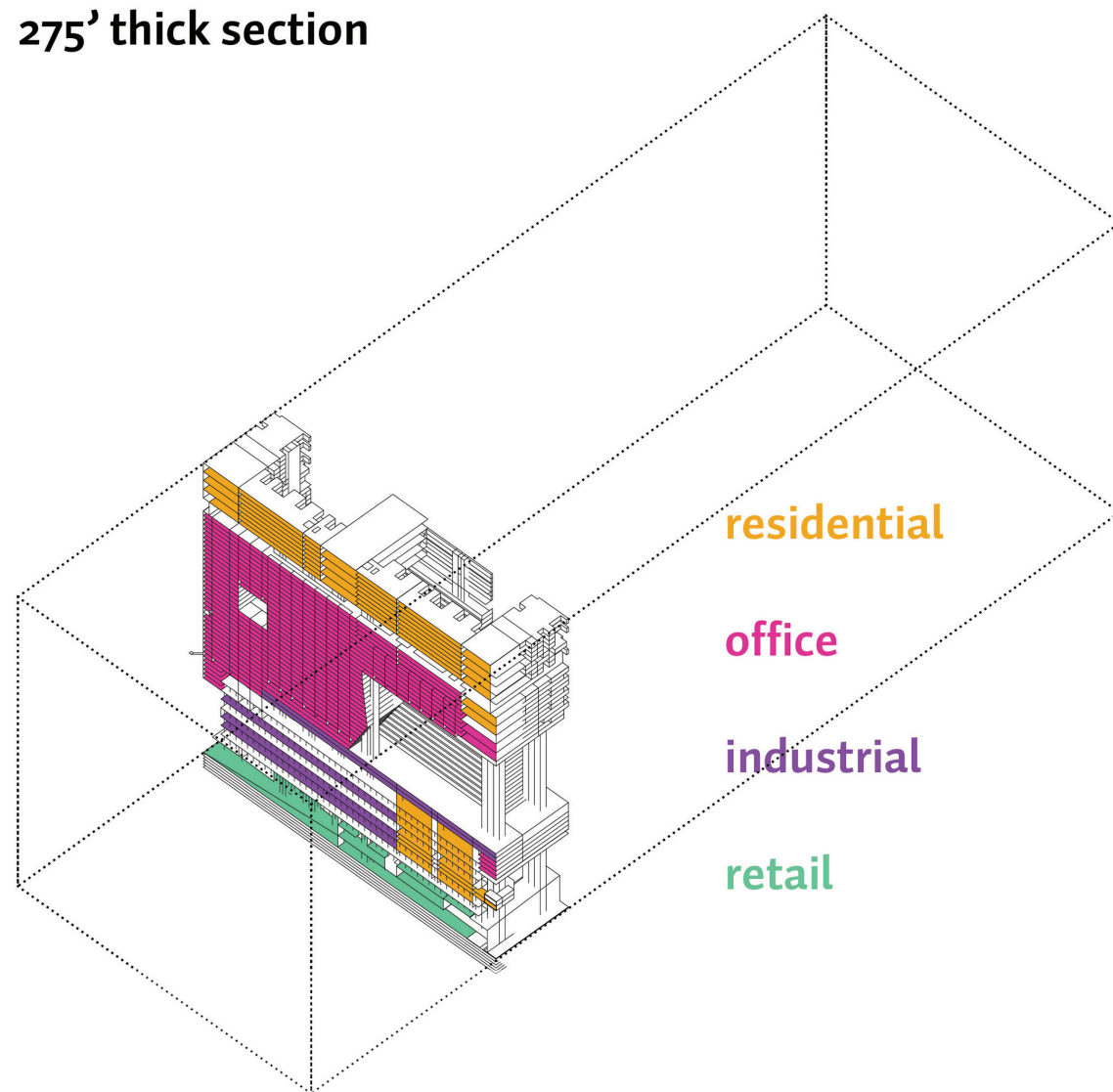


275' thick section

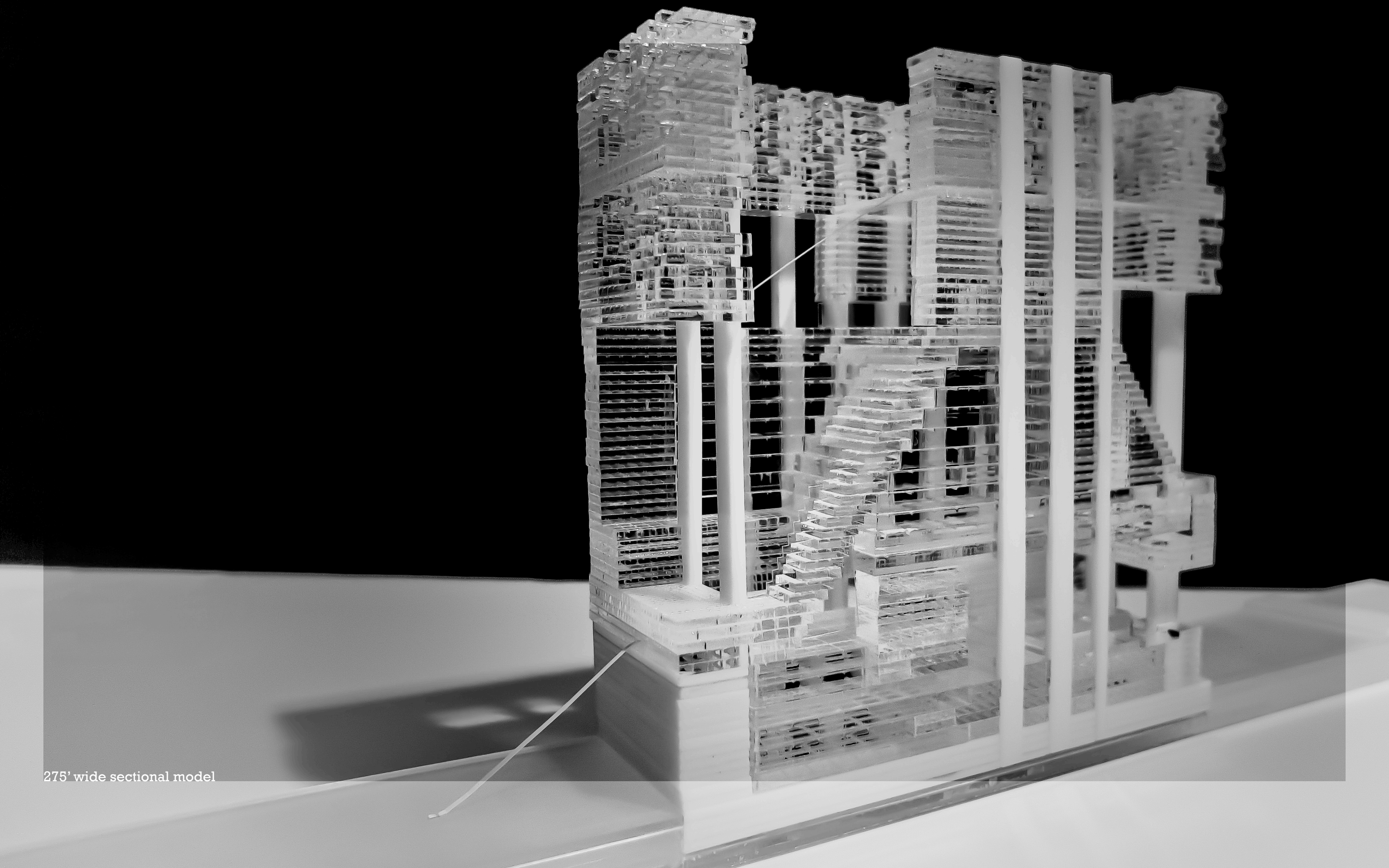




275' thick section







275' wide sectional model



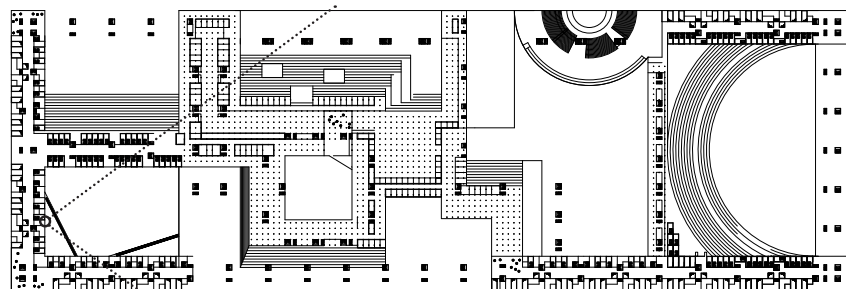
## new surface scales

The recombination of existing surface relationships, and the construction of new ones across multiple types both in the horizontal and vertical dimensions, brings the human scale back to the peripheral urban environment.

While the scales across SURFcity are still vast in size, difference, and relationship to the human, the finite container makes them comprehensible.



floor plan of  
middle levels



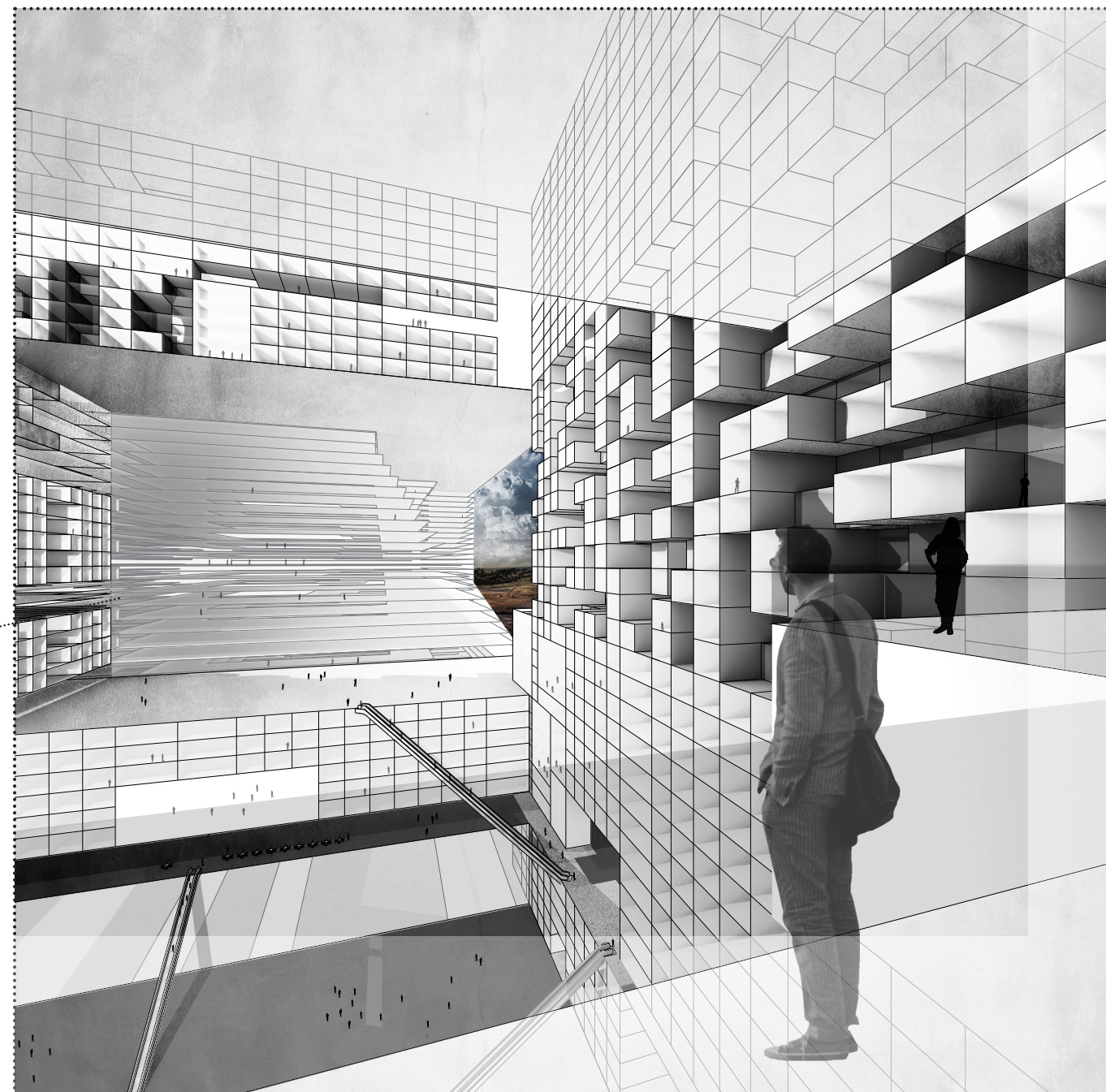
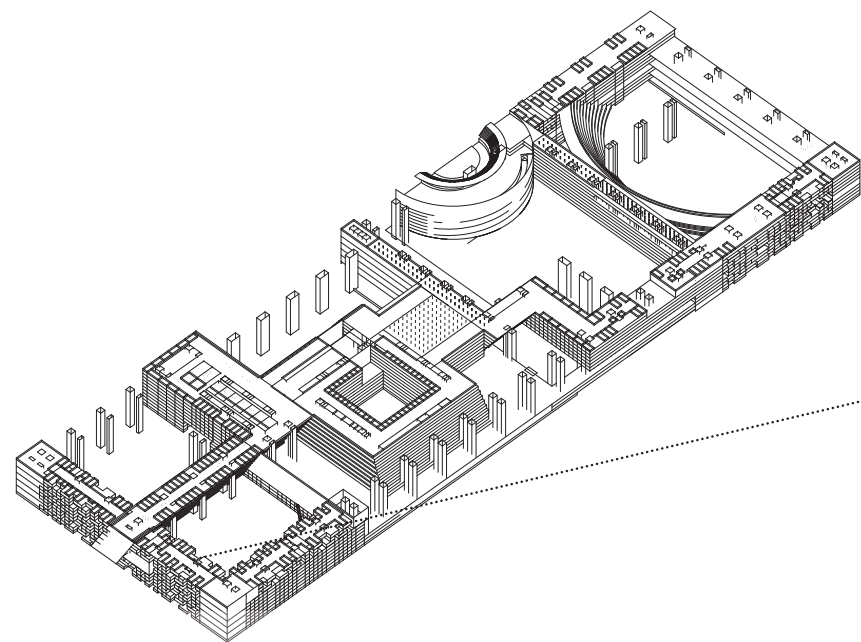
individual scale

collective scale

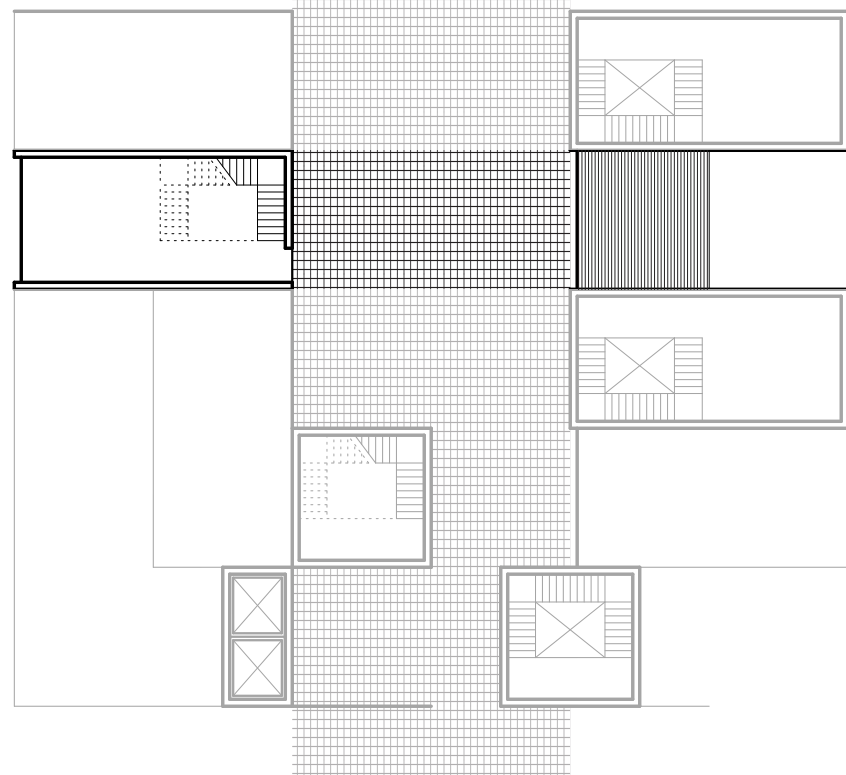
district scale

urban-pastoral scale

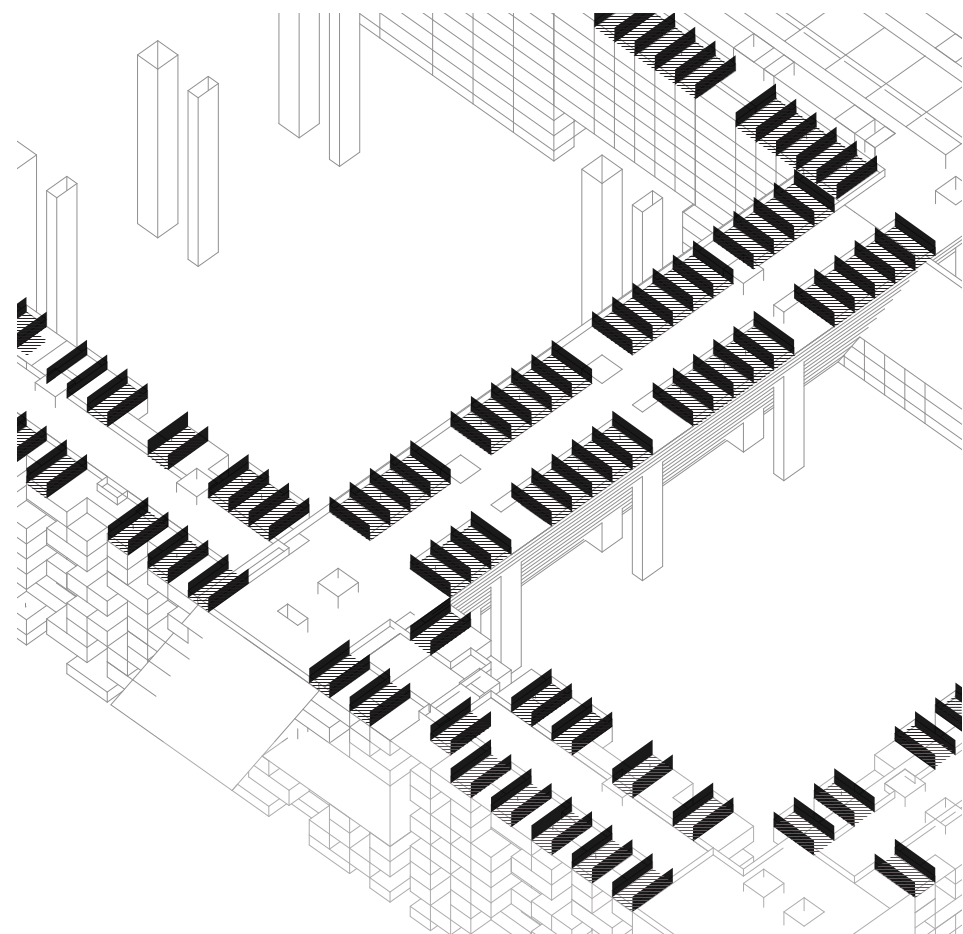
thick section of  
middle levels







floor plan of typical  
residential unit



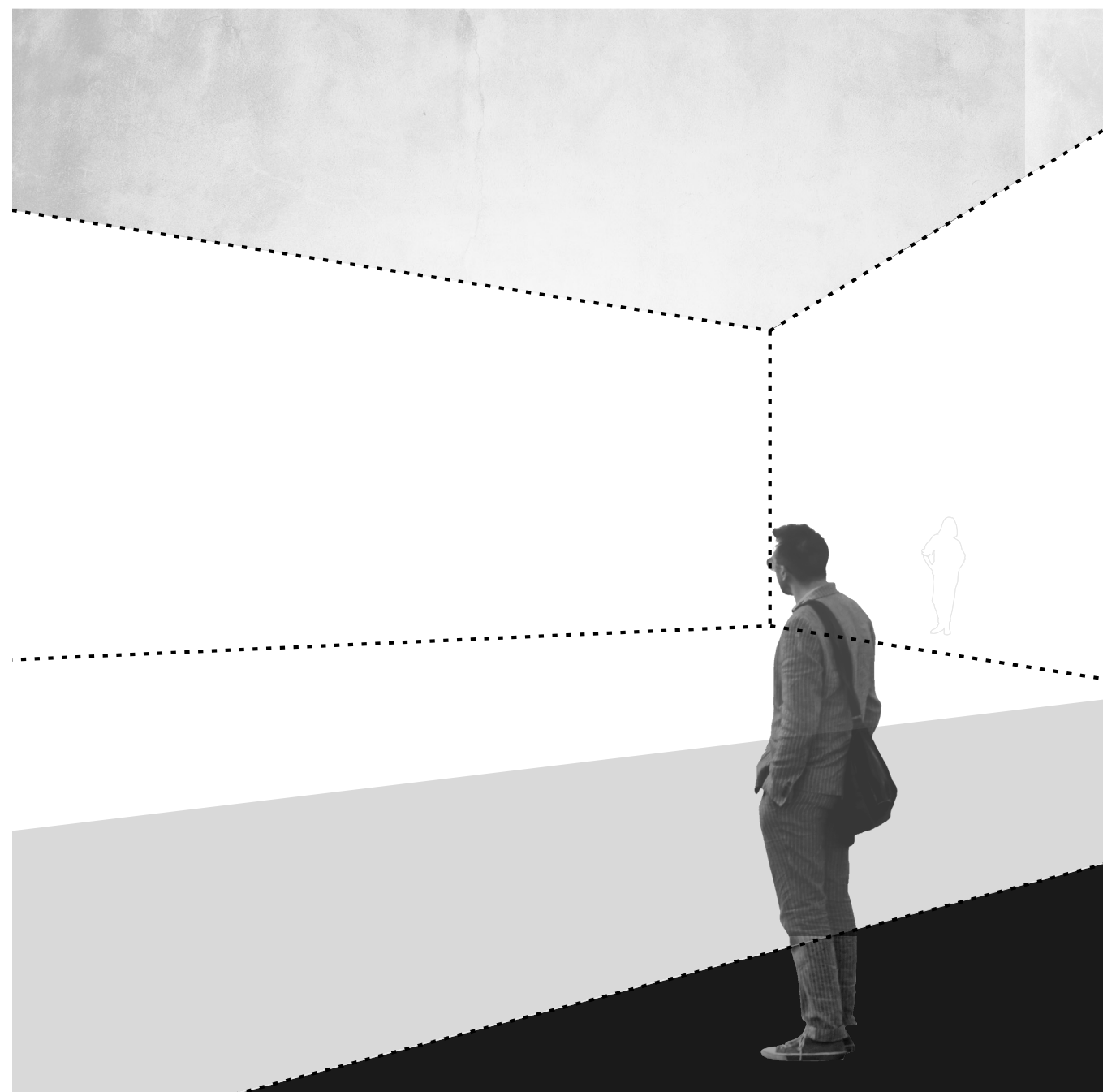
axon of typical  
individual  
residential units

individual scale

collective scale

district scale

urban-pastoral scale



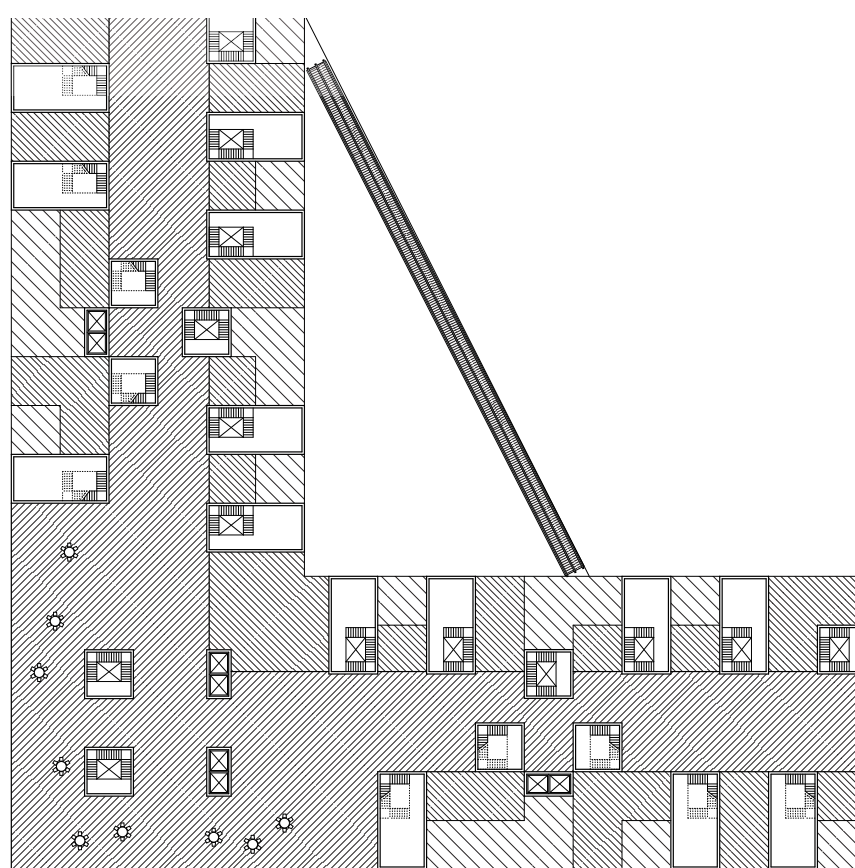
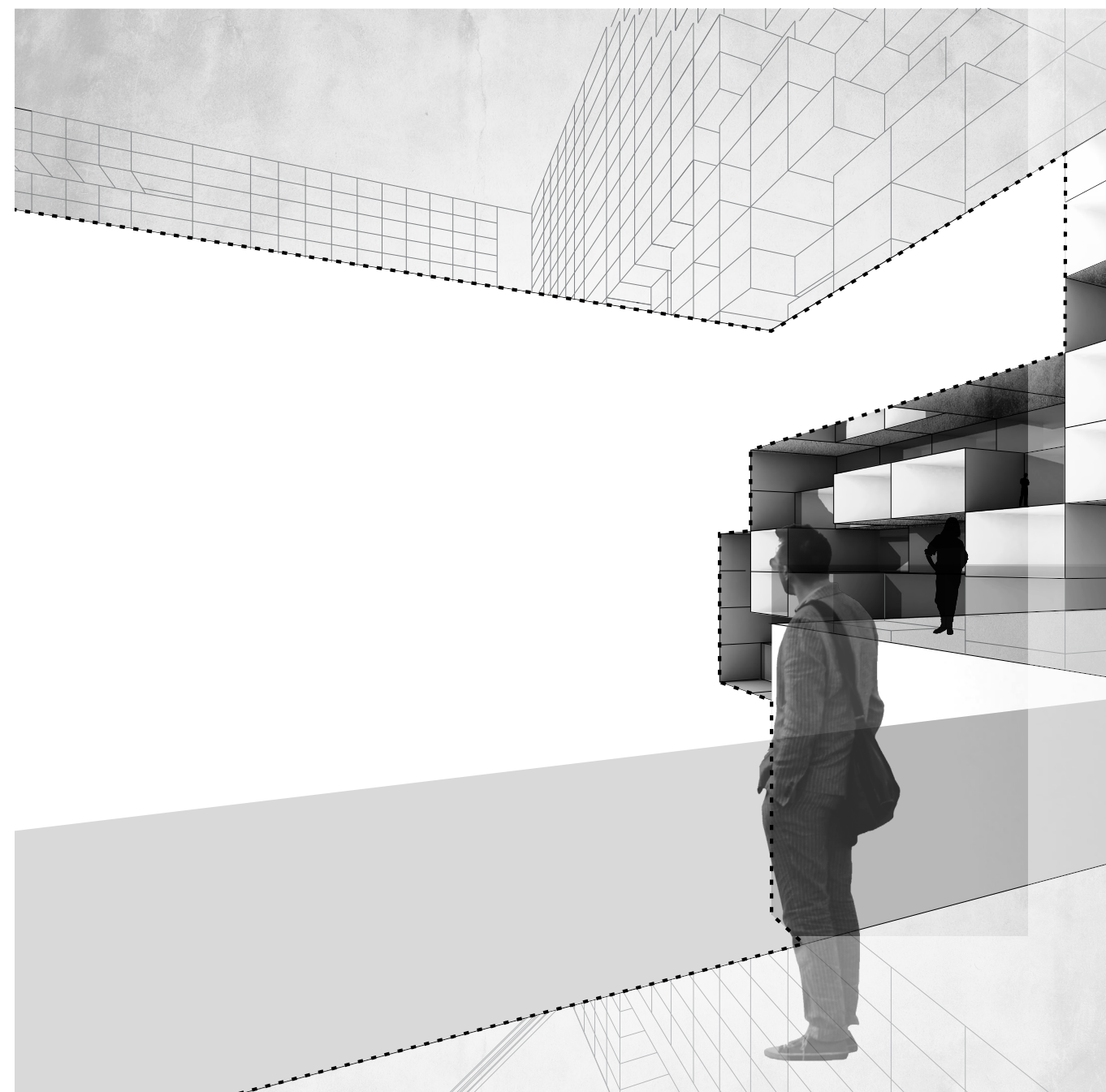
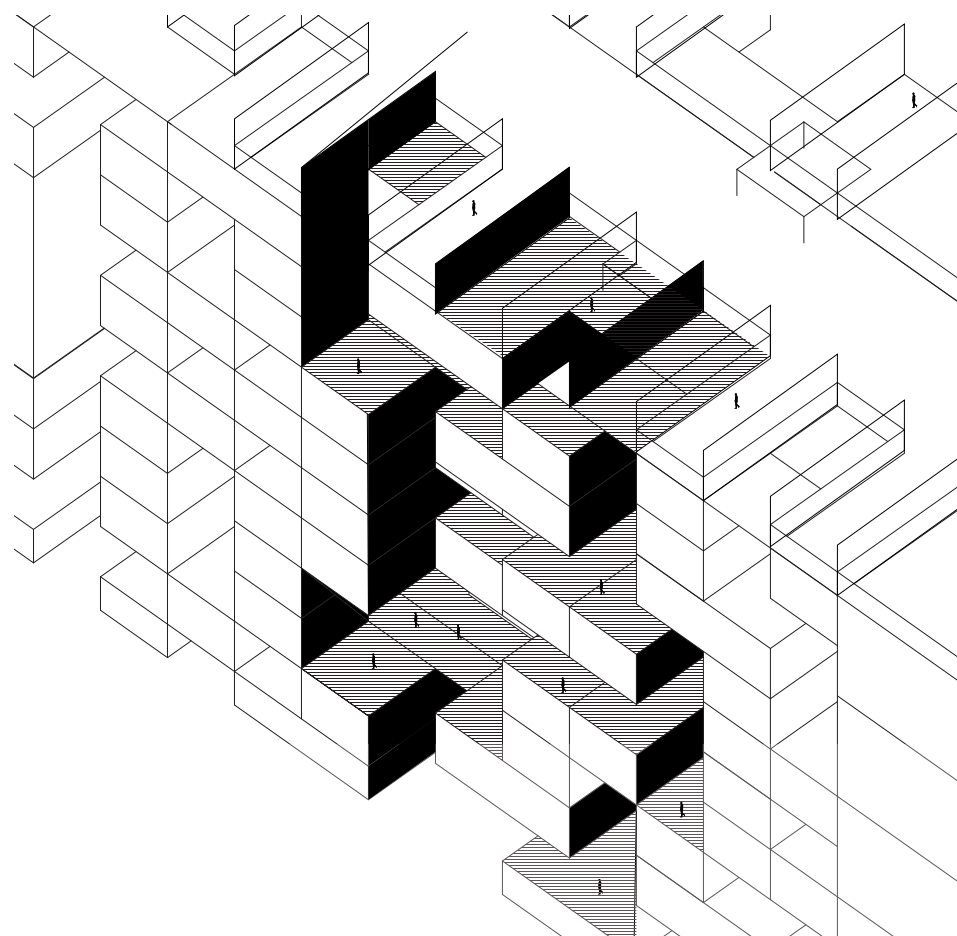


individual scale

collective scale

district scale

urban-pastoral scale

floor plan of typical  
residential clusteraxon of typical  
residential cluster



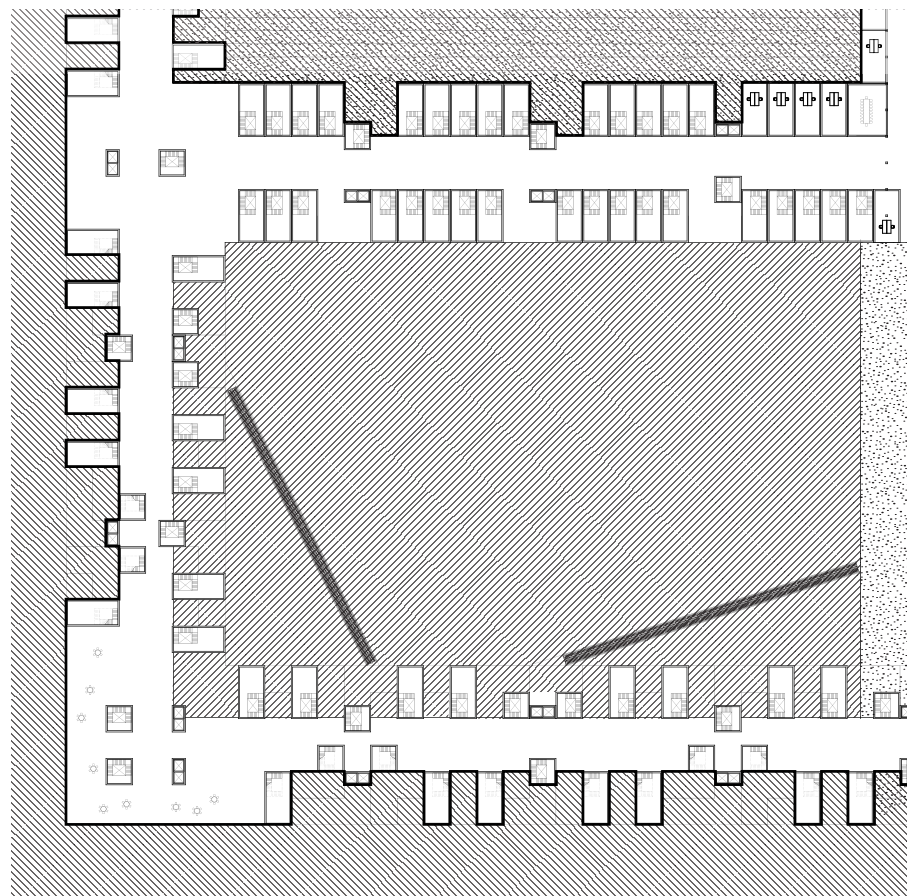
individual scale

collective scale

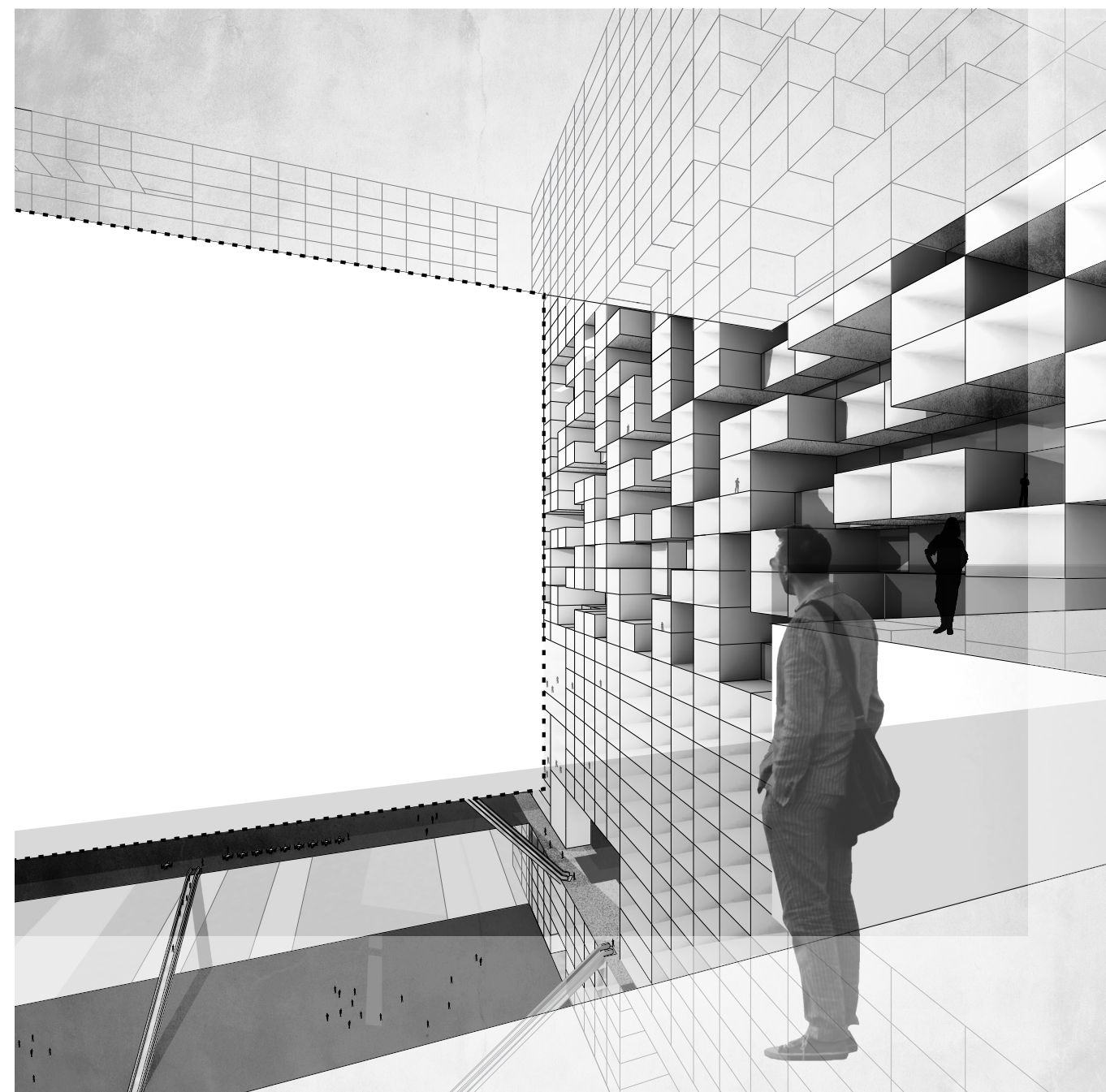
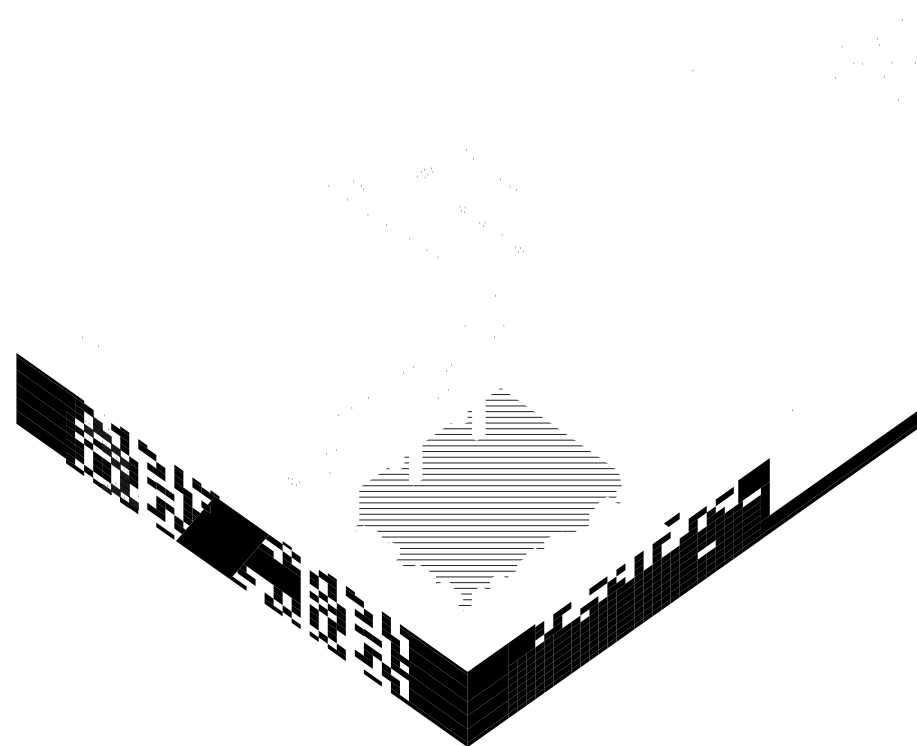
district scale

urban-pastoral scale

floor plan of typical  
residential district

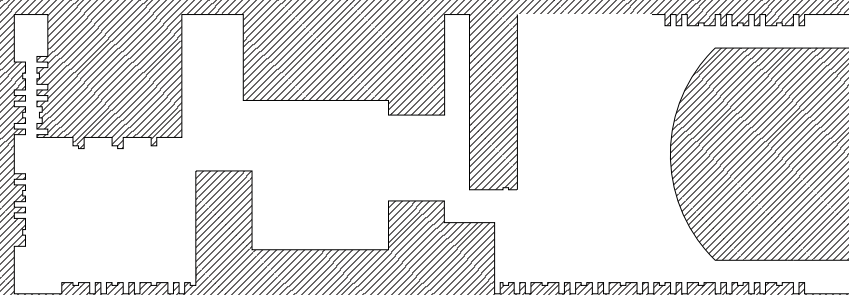


axon of typical  
residential district





fig/groud diagram  
of new city/non-  
city relationship



individual scale

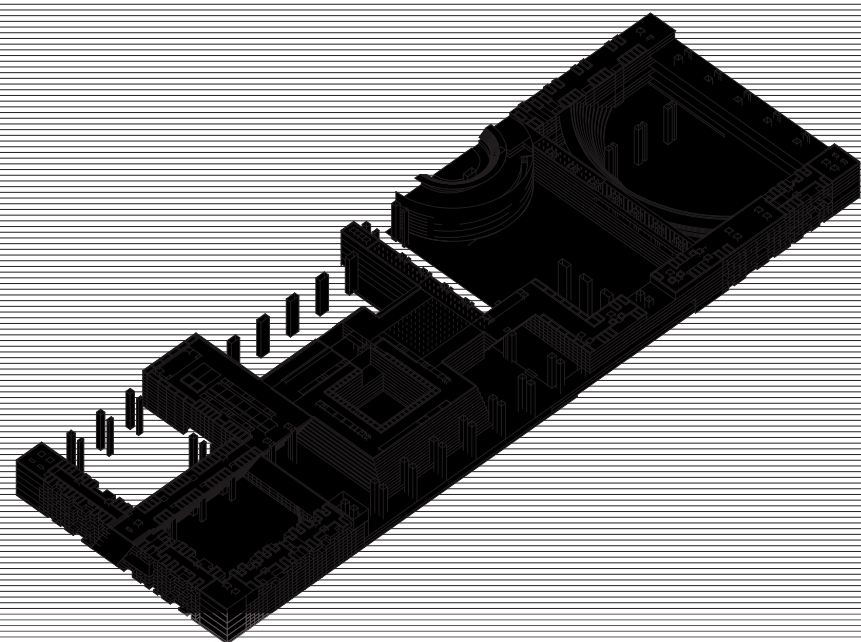
collective scale

district scale

urban-pastoral scale



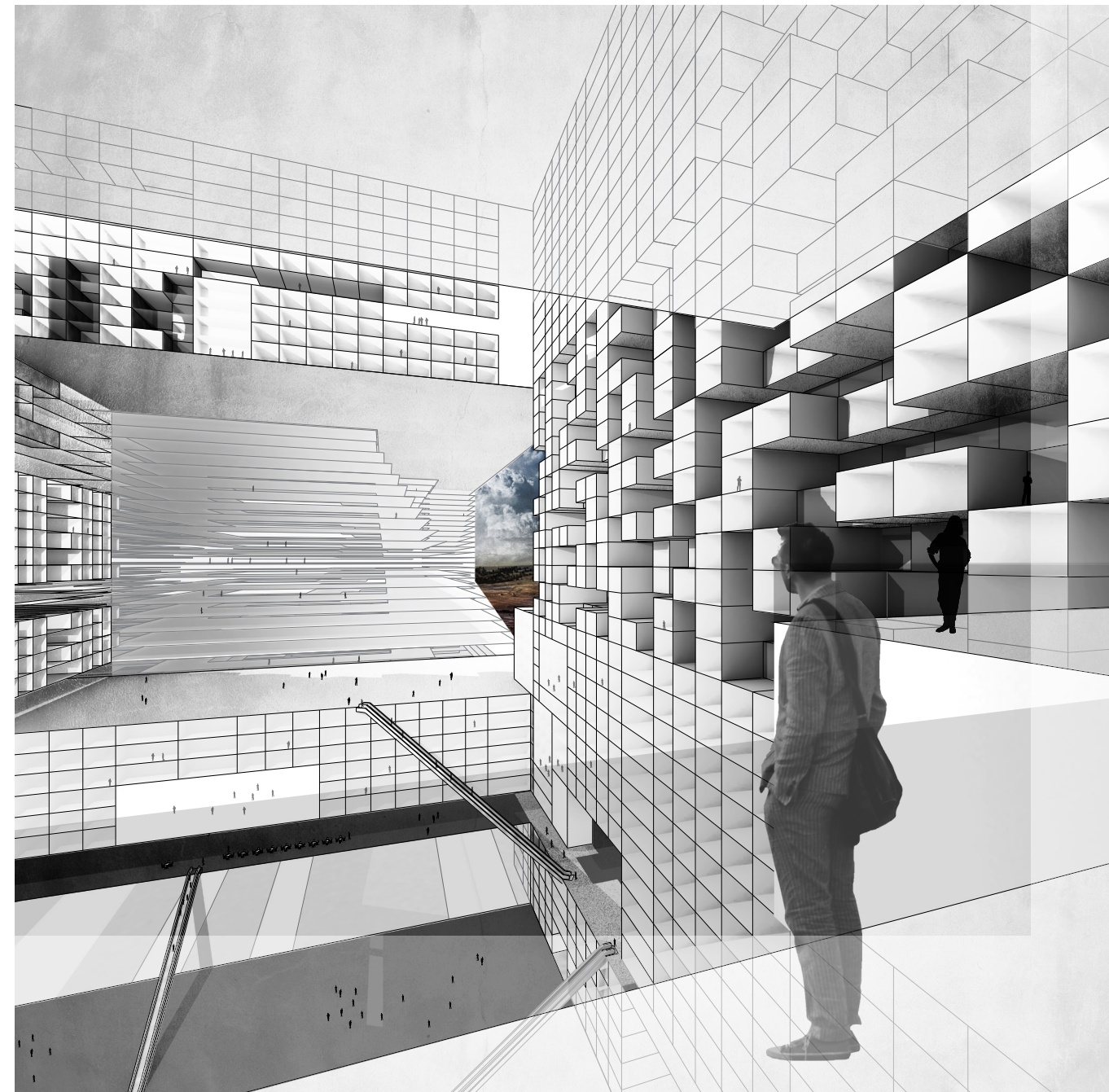
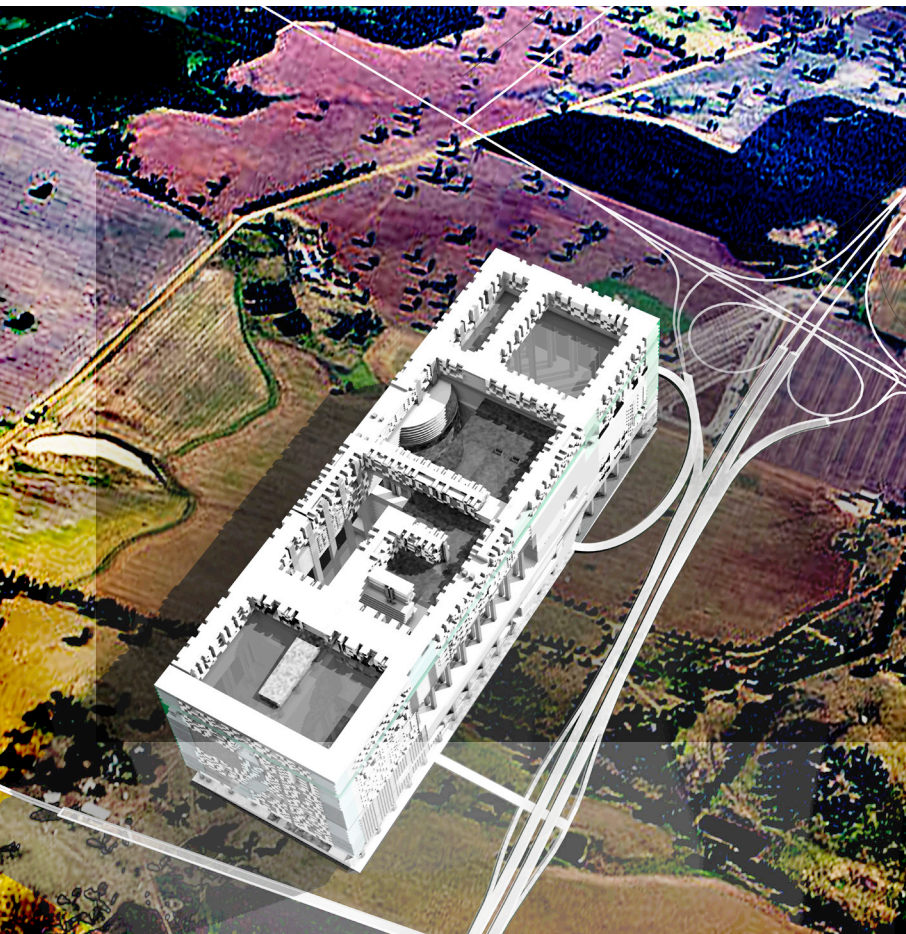
fig/groud axon  
diagram of new  
city/non-city  
relationship





By providing a new model of development through techniques of surface elaboration and densification, SURFcity brings together differences otherwise experienced at a regional scale to the human scale. Collapsing these differences into an architecturally-scaled block allows existing surface types to retain their specific qualities while producing new qualities of hybrid programming, interior public spaces, and exterior voids that are given back to nature.

The human is put back into an architectural relationship with the urban environment, and now perceives the city and its heterogeneity across multiple scales simultaneously.



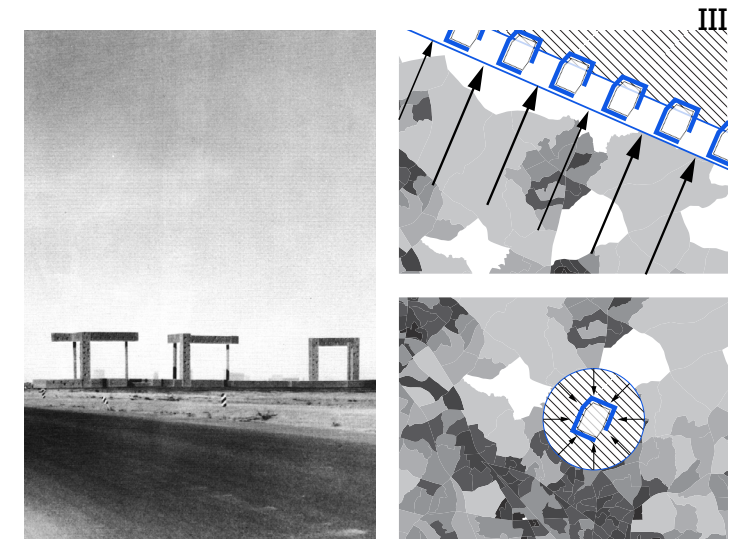


# precedents

## PERIPHERAL EDGE

Holl's *'Edge of the City'* uses dense residential form contrasted against expansive void to create collective space and perceptual understanding at regional scale.

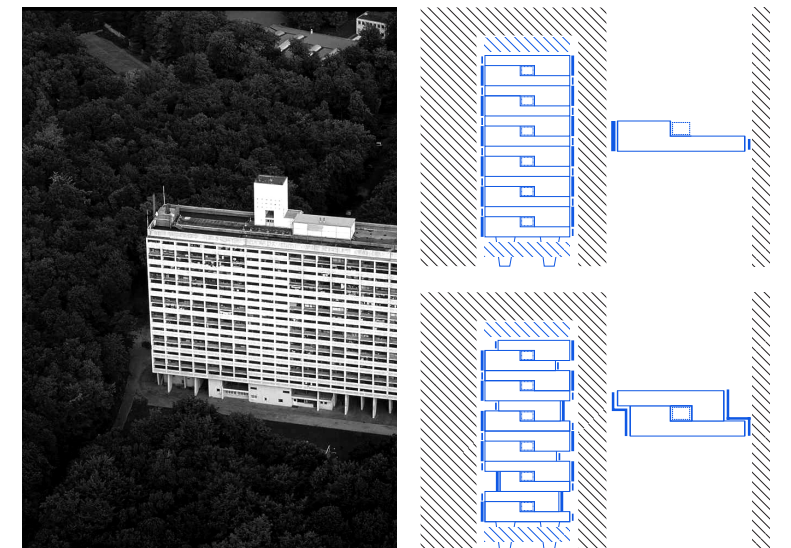
This edge defines an existing, expanded, urban region, whereas SURFcity turns this urbanism inward



## STACKED ATOMIZATION

*Unité d'Habitation* maintains the street, front, and back surface relationships of the typical individual residential unit, but densifies them in relationship to a vacuous context.

Stacked Atomization of residential units is maintained in SURFcity, while it also adds strategic collective-offsets.



## SOLID-VOID URBANISM

*Melun-Senart* redefines the solid-void relationship of the peripheral urban environment.

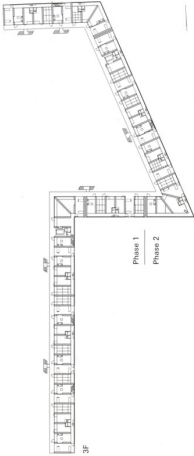
SURFcity redefines this at the level of architecture (solid), whereas M-S works at the level of planning (void)





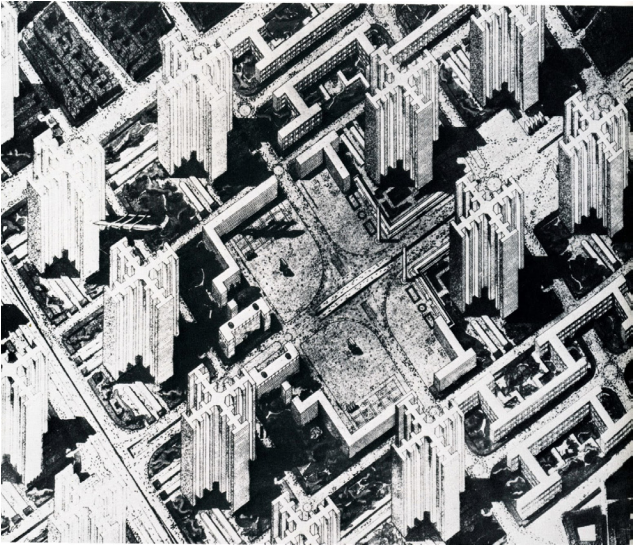
gifu HOUSING

Similar to Sanaa’s Gifu housing, the residential slab-forms of SURFcity work as urban-scaled pieces of architecture (glass walls in this case).



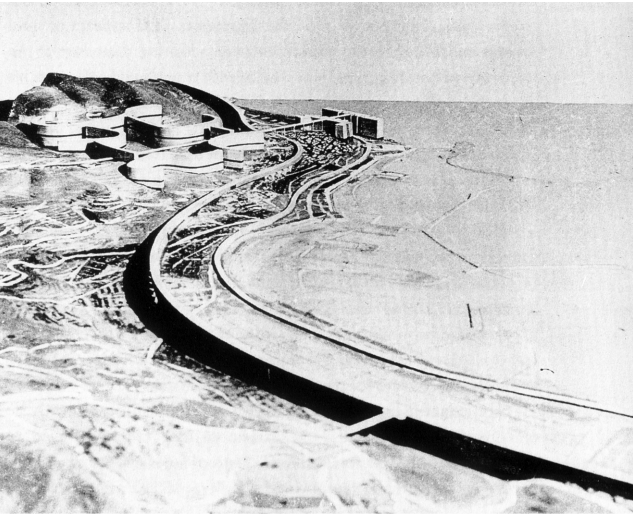
PLAN VOISIN

Density juxtaposition is played out against a vacuous context. Unlike, Voisin’s monopogrammatic forms (residential towers), SURFcity’s forms of density are diverse and hybridized in terms of program.



ALGIERS

Le Corbusier’s Algiers plan and SURFcity both redefine the new urban environment and subject’s relationship to regionally scaled forms of infrastructure. Like Voisin, Algiers is monopogrammatic, whereas in SURFcity multiple programs are introduced.





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